THE

LECTURES

OF

SIR ASTLEY COOPER, BART. F.R.S.

SURGEON TO THE KING, &c,

ON THE

PRINCIPLES AND PRACTICE

OF

SURGERY;

WITH

ADDITIONAL NOTES AND CASES,

BY FREDERICK TYRRELL, ESQ.,
Surgeon to St Thomas's Hospital, and to the London Opthalmic Infirmary.

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PREFACE.

THE delay in the publication of this volume has been occasioned by a fire at the Printer's, which destroyed the impression when it was nearly completed.

I have added a Paper by Sir Astley Cooper, on the developement of the Nipple, which he had the the kindness to send me with the following Note:

'DEAR SIR,

'I have looked over this Volume, and find it contains a correct account of the subjects treated of in my Lectures.

'I have sent you a few observations on the swellings which form in the Nipple, and upon the structure in which they are founded; this may form an Appendix to the diseases of the breast which are described in this volume.

'Yours very truly,

'ASTLEY COOPER.'

'*Spring Gardens.*'

CONTENTS.

LECTURE		PAGE
XIII.	On Injuries of the Spine,	9
XIV.	On Aneurism,	25
XV.	On the Operation for Aneurism,	44
XVI.	On Hydrocele,	70
XVII.	On the Operations for the Cure of Hydrocele,	81
XVIII.	On the Diseases of the Testicle,	94
XIX.	On the Simple Chronic Enlargement of the Testis,	110
XX.	On Diseases of the Breast,	125
XXI.	On the Treatment of Scirrhous Tubercle,	146
XXII.	On Urinary Calculi,	167
XXIII.	On the Operation of Lithotomy,	184
XXIV.	On Calculi in the Prostate Gland,	222
XXV.	Operations for Retention of Urine,	230
XXVI.	Of Fistula in Ano,	244
XXVII.	Of Polypus of the Nose,	260
XXVIII.	Paracentesis of the Abdomen,	273
XXIX.	Of Hare Lip,	292
XXX.	On Amputation,	308

LECTURES, &c.

LECTURE XIII.

ON INJURIES OF THE SPINE.

The effects which arise from violence done to the spine, are very similar to those which are produced by injuries to the head; for example—concussion—extravasation—fracture—fracture with depression—suppuration and ulceration.

ON CONCUSSION OF THE SPINAL MARROW.

Effects of.—When a person receives a severe blow upon the spine, or, from any great violence, has it suddenly bent, a paralysis of the parts below will frequently succeed, in a degree proportioned to the severity of the injury; and after such an event, the person sometimes gradually recovers the motion and sensation of the paralysed parts.

Treatment.—If the part be tender to the touch, or the patient complains of pain, blood should be taken away, near to the part injured, by cupping or leeches, and the bowels should be kept freely open. After a week or ten days, if the patient be not much relieved, a blister should be applied, and the surface be afterwards dressed with equal parts of the un-

guent: lyttæ and cerat: sabinæ. The extremities should be frequently rubbed with a liniment of a slightly stimulating nature; and as sensation returns, electricity or galvanism may be beneficially employed.

Case.—A man was admitted into Guy's Hospital (under the care of Dr Curry) who had received a severe blow from a piece of wood falling upon his loins. When he was brought into the Hospital, his lower extremities were in a great degree deprived of motion, and their sensation was much diminished. When resting on his back in bed, he could with much difficulty draw up his legs, but could not bend them at a right angle with his body; and a considerable time elapsed before he could make the muscles of his lower extremities obey the efforts of his will. As there was still the appearance of severe contusion and much deep-seated tenderness at the injured part, blood was repeatedly taken away by cupping, and his bowels were kept freely open by calomel and saline medicines. When the pain and tenderness had been removed, a blister was applied, and a discharge kept up from the surface for three weeks. The liniment: ammoniæ was rubbed on the extremities. In six weeks the motion and sensation of the limbs had nearly returned, when he was submitted to the influence of electricity. By this treatment, in ten weeks, he got perfectly well.

OF EXTRAVASATION.

Of effusion of blood into the spinal canal, I have seen but very few examples: one I recollect witnessing in St Thomas's Hospital. A man had received a severe blow upon the dorsal vertebræ, which produced complete paralysis of the lower extremities, and shortly after his admission into the

Hospital he died. Upon examination after death, slight extravasation was found in the spinal canal.

Case.—I was consulted about a very interesting case which was under the care of Mr Heaviside; the particulars of which were as follow: A young gentleman was swinging, when some of his companions caught him by the neck with a rope, during the time that the swing was in rapid motion; by which the whole of the cervical portion of the spine was violently strained. As, however, the line slipt immediately off, he thought but little of it. Subsequently to the accident, for some months, he was not aware of any pain or inconvenience; but his school-fellows observed that he was less active than usual; instead of filling up his time by play, he would be lying on the school forms, or leaning upon a stile or gate, when in the fields. From this time he continued to decline, both in strength and power. He was brought to London for advice about the middle of May. His complaints were occasional pains in his head, which were more severe and frequent about the back part and the neck, extending down the back. The muscles at the posterior part of the head and neck were stiff, indurated, and very tender to external pressure: he felt pain in moving his head or neck in any direction; added to these symptoms, there was a great deficiency in the voluntary powers of motion, especially in the limbs.

Two setons were placed in the neck, and he took various medicines, without experiencing any benefit. His complaints, especially the paralytic affection of his limbs, got much worse; besides which, he felt an extremely painful sensation of burning in the loins. In a short time this was succeeded by a sense of extreme coldness in the same part. The pulse and heat were natural.

A consultation of Dr Baillie, Dr Pemberton, Mr Heaviside, and myself, was held, and the application of mercury was determined on. The pilul: hydrarg: was taken for a few days; but as it produced violent action upon the bowels, mercurial frictions were consequently employed. He felt his limbs getting every day weaker, but his neck was more free from pain when moved, and he was more capable of moving it by his own natural efforts.

On the 7th of June his respiration became laborious; all his symptoms rapidly increased, and on the following day he expired.

EXAMINATION.

The whole contents of his head were carefully examined, and appeared perfectly healthy; but upon sawing out the posterior parts of the cervical vertebræ, the theca vertebralis was found overflowed with blood, which had been effused between the theca and the enclosing canal of bone. The dissection being further prosecuted, this effusion was found to extend from the first vertebra of the neck to the second vertebra of the loins, both included.

The preparation, which is in the museum of Mr Heaviside, only shows a small portion of the effused blood, which had become coagulated on the theca; as much of it, being fluid, escaped during the examination.

FRACTURE WITH DISPLACEMENT.

The separation of one vertebra from another is of very rare occurrence without fracture; and the supposed dislocations of the spine are, in a very large majority of cases, fractures with displacement. When this happens, the parts of the body situated

below the seat of injury become paralysed. Thus, if it occur in the lumbar vertebræ, the person immediately loses all power of motion and sensation in his lower extremities, his fæces pass off involuntarily, the action of the sphincter ani being destroyed; and his urine is retained, the bladder being unable to contract.

Of the dorsal. — When the dorsal vertebræ are the seat of this injury, all those parts situated below the fracture are paralysed, as in the former case; but in addition, the abdomen becomes distended with air, which escapes into the intestines in consequence of the diminished powers of the part; this gradually subsides after the patient's bowels have been freely opened.

Of the lower cervical. — If the fracture with displacement takes place in any of the cervical vertebræ below the fourth, the same symptoms occur in the body and lower extremities as when the dorsal vertebræ are injured; and there is also a partial paralysis of the upper extremities, but seldom such as to deprive the patient of all motion and sensation.

Of the upper cervical. — When it happens above the fourth cervical vertebra, the person generally dies on the instant; because the diaphragm is paralysed, which is the only agent in supporting respiration after such injury of the lower vertebræ of the neck; but when the fracture with displacement is above the origin of the phrenic nerve, the diaphragm loses its power, and dissolution almost immediately results.

Period of termination. — Patients rarely recover from these injuries to any part of the spine, but the period at which life is destroyed varies according to the seat and violence of the accident.

From injury to the lumbar vertebræ. — In the loins, if the displacement be considerable, the person may

die in three weeks: but if slight, the patient may survive many weeks. I recollect a case in which the patient lived two years after a supposed fracture with displacement of the lumbar vertebræ; but the precise nature of the injury was uncertain, as the friends would not permit any examination of the body after death, by which alone the extent of the mischief could have been decidedly ascertained.

To the dorsal. — The patient usually survives a much shorter period when the dorsal vertebræ are injured: although I have known a gentleman live nine months after such an accident to this part, which was occasioned by his horse falling, and rolling upon him, after leaping over a wide and deep road, to which he came unawares whilst riding at speed.

To the lower cervical. — After the occurrence of such injury between the fourth and seventh cervical vertebræ, the patient seldom lives longer than four or five days, and in some cases dies within eight-and-forty-hours after the accident.

Fracture without displacement. — Fracture of a vertebra may take place without displacement; a curious instance of which occurred in the cervical vertebræ, at the time I lived with Mr Cline, the particulars of which were as follow:

Case. — A girl received a severe blow upon her neck; after which it was observed, that whenever she wanted to look at any object, either above or below her, she always supported her head with her hands, and then gradually and carefully elevated or depressed it, according as she wished, towards the object. After any sudden shock she used to run to a table, and placing her hands under her chin, rested them against the table until the agitation occasioned by the concussion had subsided. Twelve months after the accident the child died; and on examination after death Mr Cline found a transverse frac-

ture of the atlas, but no displacement. When the head was depressed or elevated, the dentiform process of the second vertebra became displaced, carrying with it a portion of the atlas, occasioning pressure upon the spinal marrow, which was also produced by any violent agitation.

Treatment. — In the treatment of fractures of the spine, with displacement, no plan, hitherto adopted, has been productive of any permanent benefit.

Mr Cline's operation. — Mr Henry Cline, who was an excellent anatomist, and a very good surgeon, first attempted to afford relief by operation after this accident, as he thought that cases of this kind should be treated as those of fracture with depression of the skull; and he had made numerous experiments, the result of which gave him reason to suppose that such an operation might be successful. He cut down upon the spine, at the part where the displacement was evident, and having exposed the spinous process and arch of the injured vertebra, he sawed through the arch near to the transverse process with a small trephine of his own invention, and then raising the depressed portion of bone, he thus took off the pressure from the spinal marrow.

It is well known that union of bone has taken place after fracture with slight displacement of the vertebræ. Mr Brooks has a preparation showing a union of this kind; and in the museum at the College of Surgeons is another portion of spine, presented by Mr Harold, of Cheshunt, in which union has been produced after an accident of this nature. There can be no fear then as to the restoration of the part, if the pressure on the spinal marrow could be removed.

In many cases of fracture with displacement of the spine, the spinal marrow is either partially or completely torn through. In such instances little

good could result from an operation; but in others the spinal marrow is apparently but little injured; and in such cases it was, that Mr Cline thought there might be hope from an operation. Mr Tyrrell has performed the operation since Mr Cline, but both cases terminated fatally:*— whether future

* As this case has been published in a foreign work, with some inaccuracies, I take this opportunity of giving a correct detail of it.

John Buckley, aged twenty-five, a labouring man, about the middle size, and of rather spare habit, was brought into St Thomas's Hospital, on the evening of Tuesday, the 15th of October 1822, having received some injury to the spine, which was occasioned by his slipping at the time he was carrying a heavy load of cast metal: he fell about five feet, but was not aware that the metal struck him. The accident had happened early in the morning of the 13th, since which time his urine and fæces had passed off involuntarily. I saw him a few hours after his admission into the Hospital, and, on examination, found that he had lost all sensation and power of motion, below Poupart's ligament anteriorly, and the lumbar vertebræ posteriorly; in fact, the superior edge of the pelvis marked accurately the line between the sensitive and the non-sensitive parts. The spinous process of the twelvth dorsal vertebra was depressed, and he complained of acute pain when this part was touched. The temperature of all parts was equal. He had not passed any urine since his admission, but at night he complained of its accumulation giving him inconvenience, when it was drawn off. 16th. He was much the same in every respect; in the afternoon, my colleague (Mr Green) was kind enough to see him with me; when we decided that an operation, similar to that performed by Mr H. Cline, might probably be beneficial; but as our consultation was late in the day, and the operation likely to be very tedious, I deferred it until the next morning. 17th. No improvement or abatement of any of the symptoms: at half past ten o'clock he was taken into the operating theatre on his bed, being placed with his face downwards, and some pillows under the lower part of the abdomen, in order to elevate that portion of the spinal column which had been injured. My colleagues (Messrs Travers and Green) being present, I performed the following operation. An incision, about six inches in length, was made through the integuments, in the direction of the spinous processes, having that of the last dorsal vertebra in

trials will be more successful, it is difficult to say; we cannot speak decidedly on the subject, as the

the middle, over the point of which was observed some slight extravasation of blood. The muscles were then separated by the scalpel, from the sides of the spinous processes, and from the arches of the twelfth dorsal and first lumbar vertebræ, as far as the transverse processes, also partially from those above and below. During this separation some arterial hæmorrhage occurred, which was very troublesome in obstructing my view of the parts; but it was not very copious. An assistant then held aside the integuments and muscles with a broad bent piece of iron, so as to allow of the application of a small trephine on the arch of the first lumbar vertebra. After using the trephine for some time ineffectually, I cut away the spinous process of the vertebræ with a chain-saw, which enabled me to see much better the operation of the trephine; and finding that I made very little progress with it, I took, instead of it, one of Hey's small saws, with which I sawed nearly through the arch, close to the transverse process; and after having done the same on the other side, I soon succeeded in removing the larger part of the arch with a pair of strong tooth forceps, leaving but a thin portion, covering the canal. The arch of the twelfth dorsal (over which the extravasation had been observed) was distinctly found to be loose: I then proceeded to remove it, as I had done the former, which I soon effected completely, so as to expose the ligamentum subflavum: this was found divided: on elevating it, the dura matral covering of the cord was seen quite perfect, and apparently free from injury. I then removed the portion of the arch of the first lumbar, which I mentioned as having left, together with the ligament, exposing near two inches of the sheath of the cord, which appeared healthy; and under which the pulsations of the cord could be seen. The patient could now feel distinctly, on being pinched inside the thigh; which immediate return of sensation was beyond my most sanguine expectations. The edges of the wound were brought together by two sutures, dressed lightly with strips of adhesive plaster, and the patient removed to his ward, on the same bed, and in the same position.

I am much indebted to my colleague, Mr Green, for his assistance, and am happy in having this opportunity of publicly thanking him for his kindness, not only in this instance, but many others in which I have had occasion to ask his advice or assistance. The operation occupied nearly an hour and an half, during which time the patient scarcely uttered a complaint. More

first operations have been unsuccessful. The proposal is laudable, and the operation is not severe, nor does

patience is required in the performance of this operation than skill; as it is extremely tedious, and requires much care in using the saw: also in elevating the bone from the canal. The trephine is of no use; the scalpel, Hey's saw, and the forceps, are all the instruments required, with the piece of bent iron to hold aside the muscles. Mr H. Cline used this last instrument, which answers the purpose much better than the fingers of an assistant could do, and is much less in the way.

Soon after being placed in his ward, he took thirty drops of the tincture of opium, as he expressed a wish for something to make him sleep. I saw him again at three o'clock, when he said he felt very comfortable; but did not appear to have more sensation than when removed to his ward after the operation; he had not slept, in consequence of which the tincture of opium was to be repeated in the evening. Being engaged out of town, I did not see him again until about one o'clock in the morning of the 18th: he was perfectly easy; had slept, and felt me pinch his toes: a very considerable oozing had taken place from the wound, more of a serous than sanguineous nature; his pulse was feeble; in consequence of which I directed him to take weak wine and water, when thirsty. Ten o'clock. Had slept comfortably since I quitted him; serous discharge still continues from the wound, which looks healthy; the edges in several parts adhering; pulse still weak; ordered his wine and water to be made stronger. One o'clock. Complained of his bladder being distended, when I introduced a flexible catheter, and drew off about a quart of high-coloured urine. The catheter was allowed to remain in the urethra, and I desired that the bladder might be kept empty, by frequently taking out the plug and letting the urine flow off. Eight o'clock. Very easy; had passed but little urine since; pulse had got up considerably, but was soft and regular. Not having passed any fæces since the operation, I ordered an injection of common salt and barley water (the enema com: of the Hospital) to be thrown up; he felt it pass, and it was retained: wine and water to be weakened. 19th. Ten o'clock. Had slept well; pulse good; wound looking very healthy; slight suppuration; sensation more general and distinct; had not had any motion or return of the injection, in consequence of which I directed him to take four grains of calomel and a scruple of rhubarb immediately. His position (which had not been altered since the operation) being uneasy, I had him turned a little to one side,

it increase the danger of the patient; time and experiment can only determine its value. If we could

propping him well with pillows. His urine had been frequently allowed to flow off; but much had not passed. Eight o'clock. Very comfortable; pulse rather full; to omit his wine. 20th. Slept well; pulse good; sensation more distinct; wound looking well, with rather more suppuration; his position changed to the other side; has not had any motion; enema to be repeated, with the addition of an ounce of castor oil. 21st. Bowels freely open, but the passage of the fæces involuntary, although he could tell when they passed. He had not slept quite so well, on account of the nurse having loaded him with bed clothes, which occasioned very copious perspiration; pulse good: wound healthy: sensation improving: during the night, a considerable quantity of urine escaped into the bed, in consequence of the nurse having taken the plug from the catheter; it was extremely ammoniacal, and caused excoriation in two or three places about the thighs; a dry sheet was drawn under him, and powdered chalk applied to the excoriations. 22d. Slept well, but again perspired profusely; pulse weak; wound healthy; rather more excoriation: to take some diluted nitric acid, and to eat a small quantity of meat; position occasionally changed from side to side; sensation gradually increasing. 23d. Slept tolerably, perspired but very little, was rather restless; pulse good; wound healthy; the urine loaded with mucus; in consequence of which I directed that he should omit the acid, and take some liquor potassæ, with a few drops of tincture of opium, three or four times in the day. Hitherto he had been lying on his abdomen, and now and then turned a little to either side; this position was very uncomfortable to him, and the pressure on the excoriated parts very painful; I therefore ordered a clean bed to be made up, with the addition of two long soft pillows, which were placed lengthways on the bed, under the sheet, leaving a space between them; he was then carefully moved into it, and placed on his back, with the spine in the space between the pillows: he expressed much relief from this alteration, which did not occasion the slightest inconvenience. 24th. Slept well, and had turned a little to the side in the night; wound healthy; pulse good; discharge of mucus with the urine less in quantity. The catheter had been withdrawn the evening before; and, during the night, he had passed small quantities of urine of his own accord; but there is still a dribbling: he also feels distinctly the passage of the fæces, but cannot retain them. The liquor potassæ had

save one life in a hundred by it, we should deserve well of mankind; and if any good does ultimately

been given him in the night, undiluted; by which his mouth was burnt, and he objected to take any more. I, therefore, ordered a mixture of carbonate of soda, carbonate of magnesia, and mucilage, to be taken two or three times a day instead. Sensation pretty distinct to the toes. 25th. Had not slept very well; pulse good; and wound healthy; quantity of mucus in the urine larger: to take soda water. At eleven o'clock in the evening I was sent for, in consequence of his complaining of pain in the region of the bladder. His countenance was rather anxious, and he was very restless; the pain was confined to the region of the bladder; the abdomen flaccid; and the bowels freely open. The catheter had been passed, by which a considerable quantity of mucus was drawn off — this had relieved him a good deal; pulse not in the least hard or thready; to foment the lower part of the abdomen, and to take thirty drops of opium every four hours; some mucilage, alkali, and opium, to be injected into the bladder. 26th. Had slept at intervals; pulse pretty good; wound healthy; urine not so much loaded with mucus; still considerable pain at the lower part of the abdomen. Leeches to be applied immediately; the fomentation continued, and opium to be taken every four hours. 27th. Had been relieved by the application of the leeches, which I ordered to be repeated, as he still complained of pain. Slept a little; much anxiety of countenance: urine still loaded with mucus, and tinged with blood; pulse rather quick, but soft. The fomentation to be continued; bowels freely open; the pain in the region of the bladder increased a little in the evening, when I again ordered the leeches, and constant fomentation. 28th. Appeared much better; had slept well, and had very little pain in the abdomen, which was considerably distended, but not tense, or painful on being pressed; wound looking healthy; pulse much the same as yesterday; urine not so much loaded with mucus, but still tinged with blood; much troubled with flatulence: in the evening he was much the same. 29th. Had slept tolerably for a few hours after I saw him; but early in the morning awoke with pain in the stomach, and immediately began to vomit; the vomiting continued almost incessantly until I arrived at the Hospital in the morning, when it abated a little; but he still continued at intervals to throw up quantities of a dark green bilious-looking fluid, the same as he had ejected from the first; it was not frothy, nor had it a fœtid or sour smell: I ordered him to take the effervescent mixture,

result from it, Mr Henry Cline has the merit of proposing it. — Palmam qui meruit ferat.

(subcarb. of potash, mint water, and lemon juice,) with ten drops of tincture of opium, every half hour, and waited to see the effect: after taking two doses, he became much more tranquil, and went to sleep, in which state I left him. The vomiting returned occasionally during the day, but was always relieved by the effervescent mixture. In the night he was very restless; and on one occasion, when the nurse quitted his bedside for a few moments, he nearly got out of bed, and was only prevented by her return; towards morning he became more quiet, but was evidently sinking, and he died about six o'clock on the 30th, having been perfectly sensible until within a short time of his death.

The attempt to get out of bed is mentioned by Mr Charles Bell as a common circumstance in the termination of fatal cases of injury to the spine, therefore cannot be regarded as any proof of recovery of motion from the operation.

DISSECTION.

I inspected the body between three and four o'clock the same day, and the following is an account of the appearances:

On opening the cavity of the abdomen a quantity of air escaped, which had little smell; the peritoneal covering of the parietes adhered slightly to the ilium and cæcum on the right side of the pelvis, but was otherwise quite healthy; a small quantity of dark colored fluid in the cavity of the pelvis. The liver, pancreas, and spleen quite healthy. The stomach, viewed externally, appeared sound; but on opening it, the vessels of its mucous surface were found much injected with red particles, which I considered the effect of long-continued vomiting, not of inflammation. The folds of the small intestines immediately in contact with the bladder, and on the right side of the pelvis, near the cæcum, adhered together, but, more particularly near the bladder; on removing them, the bladder was exposed, much thickened, and of a bluish tint: I passed a catheter, with a view of keeping it from the pubis, that I might remove it more easily; but with a little pressure, the end of the instrument broke through its parietes; when removed, the whole of its coats were found to be in a morbid state, but more particularly the mucous one, which was much thickened, and its internal surface very rough: much as I have seen it in patients who have suffered a length of time from irregular stone in the bladder: it was altogether pulpy, and easily broken down. The

The only case in which I have had an opportunity of ascertaining this disease by dissection, was the following:

alteration of structure extended to the membranous part of the urethra. The kidneys and ureters were perfectly healthy; nor was there any other diseased appearance either in the abdominal or thoracic viscera. The fracture of the body of the vertebræ was not discovered, until the vessels, &c, covering it, had been removed. The surface of the wound made in the operation was sloughy, but this did not extend deeper than the newly formed matter. There was a deposition of lymph externally on that portion of the dura matral covering, which had been exposed in the operation, as may be seen by the preparation of the parts, which are preserved in the collection at St Thomas's Hospital; but both it and the spinal cord itself were otherwise apparently in a sound and healthy state.

REMARKS.

All attempts which have as yet been made to relieve patients suffering from injury to the spinal column, by operation, have proved unsuccessful; but, I think, under such circumstances, that, instead of deterring others from undertaking similar operations, they rather tend to encourage them in the performance.

When the above case occurred, I was not aware that any one, excepting Mr Henry Cline, had performed this operation; but I have lately received some account of a case in which Mr W. Wickham, junior, of Winchester, operated about six years ago; and I understand that Mr Attenburrow, of Nottingham, has also performed an operation of a similar nature; but I have not been able to procure any particulars of the case.

The patient upon whom Mr Wickham operated, had received a severe blow upon the back and lower part of the neck, causing fracture with displacement of the seventh cervical vertebra. The body and the inferior extremities were completely paralyzed, and there was also partial affection of the superior extremities. Mr Wickham did not see the patient until several days after the accident; and had not therefore an opportunity of performing the operation sooner than the eighth day subsequent to its occurrence, at which period he did it more

Case. — A gentleman, who resided about eight miles from London, had, by a fall, received a severe

from the earnest solicitations of the patient and his friends, than from any conviction of its being likely to prove beneficial.

The operation was easily performed, and the patient was in a degree relieved by it; his breathing became more free, and sensation returned to a considerable extent, but he died on the second day after the operation.

Mr Wickham (to whom I feel much indebted for these particulars) informs me, that the benefit afforded by the operation, even at the late period at which it was performed in this case, was such as to induce him to think much more favourably of the probable result of a similar operation, performed at an earlier period after the injury, than he did before the occurrence of the above case.

The friends of the patient would not permit Mr Wickham to examine the injured parts after death, so that he was not able to ascertain the precise extent of mischief.

In Mr Henry Cline's case the spinal marrow and its membranes had been completely torn through, so that a favourable termination could not be expected.

My patient died of inflammation of his bladder, occasioned by the irritation of the urine, which, I believe, might have been prevented; and I should have taken steps for that purpose had I then known some circumstances, of which I have since been informed, connected with Mr Cline's experiments relative to injuries of the spine. He invariably found, that when complete paraplegia was produced by the injury which he inflicted on the spinal marrow of dogs, that the bladder became affected from the action of the urine on its mucous coat. This organ having lost its nervous power, it appears that the urine becomes decomposed in it, as it does after it is voided in the usual manner, and it then acts as an irritant on the mucous surface; this might probably be obviated by frequently emptying the bladder by means of a syringe, and by injecting a mucilaginous fluid to protect the mucous coat.

The immediate, although partial, return of sensation in my patient, and the after gradual increase of feeling, are proofs that the operation was in a degree serviceable. The patient also lived long enough to show that the effects of the operation upon the parts immediately concerned in it, are not sufficient to afford any ground for objection to its performance.

Every surgeon knows what the termination of these cases without operation always is; therefore why not attempt to save the patient by an operation, easy in its performance, and not in itself productive of any serious mischief. — T.

blow on his spine, which did not, however, produce any immediate ill effect. Some time after, having been much exposed to changes of weather, he was suddenly seized with pain in his back, which was followed by paraplegia, retention of urine, and involuntary discharge of fæces. I was requested to see him on account of the retention of urine, and attended him for a length of time for the purpose of using the catheter. For several weeks his symptoms remained unchanged, excepting the appearance of a troublesome sore on the nates. Towards the close of his existence, he complained of much uneasiness and distension at the upper part of his abdomen. His appetite failed, he rejected his food, and he had a great deal of fever, with quick pulse and profuse perspiration—he sunk gradually.

DISSECTION.

Upon opening the spinal sheath, a milky fluid was found within it, just above the cauda equina; and higher up, about three inches, the spinal marrow was ulcerated to a considerable depth, and was in that softened state which the brain assumes when it is rendered semifluid by putrefaction. All the other parts of the body were healthy, excepting the bladder, which was considerably inflamed.

TREATMENT.

In a case like this, it will be required to take precautions to prevent inflammation, by cupping or leeches: subsequently, counter irritation, by blisters or tartar emetic, will be useful: issues or setons may also, in some cases, prove beneficial.

LECTURE XIV.

ON ANEURISM.

Definition. — An aneurism is a pulsating tumour communicating with the interior of the heart, or of an artery, and containing blood.

External and internal. — When an aneurism is seated in one of the extremities, or upon any superficial artery, it is generally called external; when situated upon any of the arteries of the cavities, as the abdomen or thorax, it is termed internal. In the first case, there is usually but little difficulty in ascertaining the nature of the disease; in the latter case, however, much obscurity often exists, rendering the diagnosis extremely doubtful.

Three stages of external aneurism. — In the formation of external aneurisms, three stages may be observed. At first, a small tumour is perceived, which pulsates very strongly; it then contains only fluid blood, and may be easily emptied by pressing upon the artery which supplies it, between the swelling and the heart, thus stopping the flow of blood into the sac. When in this stage, the patient does not experience much pain or inconvenience; sometimes he is attacked with cramp or spasmodic contractions of the muscles of the limb below the aneurism, more particularly when undressing to go to bed.

In the second stage, the tumour is larger and more solid, and the sac cannot be completely emptied as in the former case. The blood has in part coagulated in the interior of the sac, and its parietes have become much thickened. The size of the swelling, and its pressure on the surrounding parts, now cre-

ates pain, and retards the circulation. The pulsation is still distinct, but not so violent as in the first stage.

In the third stage, the size of the aneurism isstill further augmented, and it acquires much more solidity. The pulsation is very indistinct, and only to be felt at that part of the tumour which is opposite to the orifice in the artery. The sac is now almost filled by layers of fibrous matter, and contains but a very small quantity of fluid blood. The patient experiences much severe pain, and great inconvenience in moving the limb, particularly if the aneurism be seated near a joint; the extreme parts of the limb become œdematous, from the pressure of the tumour impeding the functions of the veins and absorbent vessels; sensation is also diminished from pressure on the nerves.

Mode in which life is destroyed. — After this the aneurism continues slowly to increase; the integument over it becomes of a dark colour; inflammation of the cutis takes place, and the cuticle is partially separated by the formation of vesicles. A gangrenous spot next appears, and in a short time an eschar is formed and separates, by which the sac is opened; some blood immediately escapes, but rarely in sufficient quantity to destroy life. The patient sinks from the repeated loss of blood, much more frequently than from one copious hæmorrhage.

At first, the opening into the aneurismal sac is small, and the bleeding which takes place usually slight, being easily stopped by pressure upon the wound; but as the sloughing process proceeds, the opening becomes enlarged, and the hæmorrhage returns, and thus, by the repeated loss of blood, the life of the patient is destroyed. Sometimes an aneurism commencing internally, but breaking externally, causes death in the same way, as for instance, an

aneurism in the thorax; but when it opens internally, the patient frequently dies instantaneously.

Sometimes destroy life suddenly. — I have, however, known the bursting of an external aneurism cause immediate loss of life. A man had an aneurism in the groin, which burst on his making an attempt to throw off his bed clothes and to raise himself in bed, and he died in a few moments.

Not always destructive. — An aneurism does not always prove destructive to life, although no operation be performed for its cure. I have seen gangrene of the foot and lower part of the leg produced by a popliteal aneurism; the gangrenous parts separated, and the patient recovered.

Internal aneurism. — I shall now describe internal aneurisms, which differ in some respects from the external.

ANEURISM OF THE HEART.

An aneurism of the heart consists of a sac formed externally to the parietes of that organ, but having an opening in it, which communicates with the interior of one of the cavities. It is a very rare disease, and I have only seen three specimens of it; for the dilatations of the ventricles, which are not uncommon, and which are frequently called aneurisms, are not really so. We have two preparations of this disease in the Museum at St Thomas's Hospital.

Case. — One of the cases, in which I had an opportunity of seeing the disease, was under the care of Mr Palmer, assistant surgeon in the army. A soldier belonging to the regiment to which Mr Palmer was attached, received a severe flogging, and during the punishment he held his breath; he shortly after this complained of a violent pain in his chest, which was quickly followed by ascites

and œdema of his inferior extremities. He died suddenly, and upon inspecting his body after death, Mr Palmer found, that an aneurism which had been formed on the left ventricle, had burst into the cavity of the pleura on the left side.

Case. — Another case occurred under Mr Postlethwaite, of Chichester. The patient had symptoms of organic disease of his heart, with ascites and œdema, as in the former case. The man died suddenly, and an aneurism of the left auricle was found on examining his body. The aneurism was of the size of a large walnut, and a quantity of blood was effused between the coats of the auricle.

ANEURISM OF THE ASCENDING AORTA.

The commencement of the aorta, just where it is covered by the pericardium, is not an uncommon seat of aneurism. We have some preparations in the Museum at St Thomas's Hospital, showing the disease situated at this part. In one of these specimens the aneurism had burst into the pericardium, which was found filled with blood. The history of the patient from whom this aneurism was taken, may be useful, in order to make you cautious in such cases.

Case. — A man who had been admitted into Guy's Hospital, under my care, having a popliteal aneurism, was taken into the operating theatre, for the purpose of having a ligature put upon his femoral artery. He was placed upon a table in the proper position, and I had commenced the operation, when he stretched himself on his back, and I perceived his urine flowing from him. This, I said, is something more than common apprehension, or expression of pain; I took out a lancet, and opened a vein in his arm, but the blood did not flow; I then tried

to bleed him from the jugular vein; he gave a deep gasp, and in a few minutes was dead. The next day I opened the body in the presence of the pupils, when I found the pericardium distended with blood, which had escaped from an opening in an aneurism seated at the beginning of the aorta, immediately above the semilunar valves. If I had finished the operation, I might have had the credit of killing this patient.

You should be particularly careful not to perform an operation for an aneurism, until you are satisfied that no others exist, as it often happens that many aneurisms form in several parts of the same individual at once. Mr Cline was about to operate upon a man in St Thomas's Hospital, who had a popliteal aneurism, but deferred it on account of the patient's complaining of pain in his abdomen. A few days afterwards the man died suddenly, and, on examination, an aneurism was found between the two emulgent arteries, which had burst into the abdomen.

Aneurism producing absorption of bone, &c. — Absorption of part of the sternum and of the cartilages of the ribs, sometimes takes place from the pressure of an aneurismal sac, situated between the heart and curvature of the aorta. We have a preparation in which three of the cartilages of the ribs, and a considerable portion of the sternum have been thus destroyed.

Progress of this aneurism. — An aneurism seated on this part of the aorta, at first usually presses upon the lung, producing oppression in breathing and cough, and is, at this stage, often confounded with dyspnœa arising from other causes: but as the disease increases, the upper part of the chest becomes enlarged, and a pulsation may be distinctly felt by pressing on the intercostal spaces. The cartilages of the ribs are then absorbed, and subsequently

a portion of the pectoral muscle; inflammation is produced in the integument; an eschar forms in the centre of that inflammation, and as the eschar gradually separates, the patient loses his life from hæmorrhage.

Life may be prolonged. — In these cases the life of the patient may be often prolonged, even after bleeding has commenced, by coating the wound, and forming an artificial sac; and two or three weeks may be thus added to life, and enable the patient to prepare for that 'bourn from which no traveller returns.'

Case. — A woman was admitted into Guy's Hospital, having an aneurism of the ascending aorta. The skin became inflamed, an eschar formed and in part separated, so as to allow of the escape of a quantity of blood; the hæmorrhage stopped in consequence of a coagulum plugging up the orifice, and the wound was more completely closed, by the application of some lint, confined by plasters and bandages: no further bleeding occurred, but the patient died twenty-seven days after the first hæmorrhage, in consequence of inflammation of the aneurismal sac, and of the aorta.

ANEURISM OF THE CURVATURE OF THE AORTA.

These aneurisms project just above the sternum, and they destroy life in different modes; sometimes bursting externally, as in the former examples, sometimes occasioning death by their pressure. I have an example, given me by Mr Davis, formerly surgeon of the Custom House, in which death was produced by its bursting into the trachea. The man was rising from his bed, when he was seized with cough, immediately expectorated blood, and died in a few minutes from suffocation and loss of

blood. Upon dissection, an ulcerated opening about the eighth of an inch in diameter was found in the trachea from the aneurismal bag.

Sometimes resemble carotid aneurism. — Aneurisms beginning from the curvature of the aorta, sometimes rise to the middle of the neck, and assume the appearance of carotid aneurism. A specimen was given me by Mr Dyson, surgeon, of Fore Street, who sent me to say, that he had a carotid aneurism under his care, which he wished me to examine. I found a tumour in the side of the neck, but thought I could trace a small swelling from it to the sternum, and, therefore, refused to operate. The patient lived seven months, and Mr Dyson gave me the aneurism which sprung from the curvature of the aorta: a large bag was formed in the neck, communicating by a narrow canal with the curvature of the aorta.

Case. — Mr Allan Burns, formerly a most excellent surgeon and anatomist at Glasgow, wrote to me respecting a pulsating tumour above the clavicle, upon which it was proposed to perform the operation for aneurism. In my answer, I said, Take care that the case which you have described is not an aneurism of the aorta. The operation was not performed; the patient died of the disease, which proved, upon dissection, to be an aneurism of the aorta. This case is mentioned in Mr Burn's excellent work on the anatomy of the neck.

Produce suffocation. — Aneurisms of the curvature of the aorta sometimes destroy, by their pressure on the trachea producing suffocation; sometimes they occasion great difficulty in swallowing, by their pressure on the œsophagus; and when seated at the lower part of the curvature, they now and then appear at the back between the scapulæ.

ANEURISM OF THE ARTERIA INNOMINATA.

This case will rarely allow of an operation. Here is a specimen of it, and you will see that there is scarcely any space between the aneurism and the aorta; and I think it one of the most difficult operations in surgery. My friend, Dr Mott, of New York, is the only person who has had the intrepidity to put a ligature on this vessel: the patient, for a time, appeared to be doing well, but ultimately did not recover.

ANEURISM OF THE DESCENDING AORTA WITHIN THE THORAX.

On the aorta in the posterior mediastinum, I have seen three small aneurisms. When they become large, they sometimes burst into the œsophagus. I have an excellent preparation given me by Mr Armiger, in which you may see a large aneurismal bag with an ulcerated opening into the œsophagus. The patient died from profuse vomiting of blood. In the morbid collection at Guy's Hospital, you may see a similar specimen taken from a patient of Mr Foster's, who not only vomited blood, but passed a considerable quantity by stool.

ANEURISM OF THE ABDOMINAL AORTA.

When an aneurism is seated above the cæliac artery its pulsation may be distinctly felt at the scrobiculus cordis: and the pressure of the swelling on the upper curvature of the stomach produces so frequent an inclination to vomit, that the patient is under the necessity of observing extreme abstinence, to keep the stomach in a quiescent state.

Bursting into an intestine. — When the aneurism is seated lower down, and on the fore part of the aorta, it sometimes bursts into an intestine. Dr Scudamore brought a gentleman to my house, who had a pulsating tumour just above the umbilicus. A few weeks afterwards I was sent for to this gentleman at Henley, who had been seized with fainting, and a discharge of blood by stool: he revived a little, but on the following morning the discharge of blood returned, and he died suddenly: in the aneurism which I removed from him, you may see that the jejunum had adhered to the fore part of the aneurismal bag, and that the sac had ulcerated into the intestine.

Producing absorption of the vertebræ. — When the aneurism arises from the posterior part of the aorta in the abdomen, it presses upon the spine, and produces absorption of the vertebræ: it then proceeds until it appears between the last rib and spine of the ilium in the loins. In a specimen taken from a patient in the other Hospital, by Mr Howden, the aneurism projected into each loin. As the aneurism, when it appears in the loins, and has acquired any magnitude, does not in general pulsate, you must be upon your guard that you do not mistake it for lumbar abscess, a circumstance I once saw happen. A surgeon, in a hasty way, said, 'This is a lumbar abscess,' and plunged a lancet into it, and then with something of a similar exclamation, he said, 'God bless me! this is blood;' a piece of adhesive plaster was applied covered by a roller, and the wound healed, and the patient afterwards died of the bursting of the aneurism internally.

Appearing at the ischiatic notch. — I have seen an aneurism seated in the cavity of the pelvis pass through the ischiatic notch under the gluteus maximus muscle, where it produced a large pulsating tumour, which I at first thought was an aneurism of

the gluteal artery; but feeling apprehensive that it might have some communication with the vessels of the interior of the pelvis, I would not operate; and the patient, before he died, had an hæmorrhage from his bladder, which showed that the aneurism was seated within the pelvis, and that it had protruded into the ischiatic notch.

OF THE SIZE OF ANEURISMS.

The aneurism given me by Mr Howden is the largest I have ever seen: it began from the posterior part of the aorta by the emulgent arteries; on the one side it passed into the loins, and it there contained many pounds of blood; on the other side it first projected into the loin in the situation of the left kidney; it then descended over the psoas muscle under the sigmoid flexion of the colon, and terminated on the brim of the pelvis.

OF THE NUMBER OF ANEURISMS IN THE SAME INDIVIDUAL.

The greatest number of aneurisms which I have seen in the same person is seven: an Irish labourer came into the other Hospital, with an aneurism at the origin of the arteria profunda, and another in the femoral artery, near the middle of the thigh. I tied the external iliac artery above Poupart's ligament, and the man, some time afterwards, died of an aneurism at the bifurcation of the aorta, which burst into the cavity of the abdomen: I injected the limb, in which you have an opportunity of seeing beautifully the anastomosis of the iliac artery, with the vessels of the thigh. Upon examination of this man's body, an aneurism was found in each ham; one at the bifurcation of the aorta,

one at the origin of the arteria profunda, one in the middle of the thigh, and two between the popliteal aneurism and the femoral, making in all seven aneurisms.*

* The following case is curious, perhaps, on account of the number of aneurisms which existed in the same person; but I have introduced it because, having received a useful lesson from it myself, I think the history of it may be of service to others.

W. Wardle, æt. 47, was admitted into St Thomas's Hospital, on the 29th of May, 1823, on account of a large swelling, which occupied the left ham, and extended on to the fore part of the thigh, just above the knee, projecting chiefly on the inner side over the vastus internus muscle. The integument was florid, and he had rigors, with other symptoms of suppuration. On attentively examining the swelling, I found an evident sense of fluctuation, and pressing my hand firmly on it, I could feel a thrill, which was also felt by several gentlemen who were with me at the time. His own history of the disease was very unsatisfactory, and certainly rather indicated the formation of an abscess than of an aneurism. There being considerable doubt about the precise nature of the swelling, on the following morning I requested Mr Green and Mr Key to see the patient with me: in examining the part, neither of them could feel the thrill I before mentioned; and, on consultation, we determined that a small puncture should be made; as little harm could result from it, even if it proved to be an aneurism. I therefore carefully introduced a lancet near the boundary of the tumour, on the upper part over the rectus muscle, when a jet of arterial blood at once convinced us of the true nature of the disease. The opening was immediately closed by the pressure of the finger on it, and the patient was conveyed into the operating theatre, that a ligature might be placed on the femoral artery. Whilst feeling in the course of the artery, before commencing the operation, I found a small aneurism near the part in which I had intended to secure the vessel; this led to a more minute examination of the patient, and at that period another aneurism was found, just above the tendon of the triceps, on the same side, making two femoral aneurisms and a popliteal on the left side. On the right side the artery felt dilated in several places, but a little below Poupart's ligament an aneurism existed as large as an egg.

After further consultation, it was decided that I should tie the femoral artery between the two small aneurisms, as we feared

Query — Had his occupation, which obliged him to mount very high ladders, been the means of producing this very extensive disease?

ANEURISMS LOCAL OR GENERAL.

When they occur opposite to a joint, a partial disease of the artery often gives rise to them; but, when they are seated in other parts of the body, there is usually a disease in the arteries, which produces a general disposition to their formation: the ultimate success of operations will depend very much upon the disposition to the disease being partial or general.

that a ligature on the external iliac would not command the hæmorrhage from the aneurismal sac; and it appeared probable, that the superior aneurism, which was small and situated below the profunda, might become obliterated (if the circulation through it were prevented) by coagula forming in it, as in a healthy artery. I therefore exposed the vessel in the usual manner, and placed a ligature on that portion which was situated between the two aneurisms; this was about one or one and a quarter inch in length, and appeared sound.

Four days after the operation, I left town for three weeks, during which time he remained under the care of my colleagues; the extremity became gangrenous, and the aneurismal sac in the ham sloughed, exposing the femur. A consultation was held, at which Sir Astley Cooper attended, about the propriety of amputating; but it was not thought advisable, on account of the diseased state of the arteries. The ligature did not separate from the wound until the sixth week; and the patient lingered until the 28th of July.

DISSECTION.

The popliteal and inferior femoral aneurisms of the left side had been destroyed by sloughing; that above the ligature was not closed. On the right side were found three femoral aneurisms, and a small popliteal, making in all seven; besides some dilatation of the aorta, immediately above the bifurcation. — T.

OF THE AGE AT WHICH ANEURISMS GENERALLY OCCUR

The period of life at which they most frequently occur is between thirty and fifty years; at that age, in the labouring classes, the exertions of the body are considerable, and its strength often becomes diminished: in very old age this complaint is less frequent, as muscular exertion is less. The greatest age at which I have seen aneurism has been eighty years: this was in a man for whom I tied the femoral artery in Guy's Hospital, for popliteal aneurism; and, notwithstanding his advanced age, I never had an operation succeed better. I also operated upon a man of sixty-nine years, and that case also did well. A boy, in this Hospital, had an aneurism of the anterior tibial artery, who, I was informed, was only eleven years of age. The man of eighty was the oldest, and the boy of eleven the youngest, which I have seen with aneurism. Age, with general good health, forms no objection to the operation.

OF THE SEX MOST DISPOSED TO ANEURISM.

The male is much more subject to this disease than the female: women are rarely the subject of aneurisms in the limbs; the reason for which is, that they do not exert themselves so much as the other sex. In forty years' experience, taking the Hospital and private practice, I have seen only eight cases of popliteal aneurism in the female, but an immense number in the male. The aneurisms which I have seen in the female, have been the greater number in the ascending aorta, or the carotid arteries.

OF THE FORMATION OF ANEURISM.

The first circumstance which occurs in an artery which is about to produce an aneurismal swelling is, that it becomes opake and slightly inflamed; a small yellow spot appears in the part where the aneurism is afterwards formed, and there is a slight efflorescence surrounding it; a process of absorption next thins the coat of the artery, so that its texture becomes like a fine web of cellular tissue: at this time nature sets up a process of defence, which is beautifully exemplified in a preparation in St Thomas's Museum; it is an incipient aneurism of the aorta; the coat of the artery has been absorbed, and opposite to the parts absorbed you observe a layer of adhesive matter, by which a defence is produced, and the progress of the disease for a time resisted; a covering is formed by the adhesive inflammation, which strengthens the artery and prevents the immediate escape of blood. As the coat of the artery is absorbed, the part in the vicinity of the artery becomes united to its surface by the adhesive process: thus, if it be an aneurism of the ascending aorta, the pleura is united with it, and forms a portion of the aneurismal bag; the pleura becomes absorbed and the lung forms a part of the sac, the lung and pleura costalis are absorbed in their turn, and the intercostal muscles and cartilages of the ribs form a part of the sac; these removed by absorption, the pectoral muscle becomes the sac, and when this is absorbed, the skin, which is the only covering for the blood, inflames, dies, and sloughs in the way I have already described, and the person loses his life from hæmorrhage.

Former opinions. — Aneurisms were formerly supposed to be produced by the dilatation of the coats

of an artery, and those which arose from wounds or lacerations were called spurious; but Scarpa first clearly described that aneurism arose from the absorption of the coats of an artery, and that consequently they are generally spurious.

CAUSES OF ANEURISM.

A diseased state of an artery. — The general cause of aneurism is a diseased state of the coats of an artery, by which it becomes altered in its appearance and thinner in its texture; but this, although the most frequent, is not the only cause of the disease, for sometimes the artery becomes dilated in its whole circumference. Two excellent specimens of this dilatation are to be seen in our museum. One, in which the general dilatation exists beyond the curvature of the aorta; and the other, in which it occupies the whole of the curvature.

Laceration of an artery. — Aneurisms are also produced by laceration of arteries, without any external wound, of which the two following instances have occurred in my practice: A gentleman, who was shooting, in leaping a ditch, slipped from the top of the bank; at this moment he felt something snap in his ham, and when he attempted to walk, he found himself lame from the accident; he was attended by Mr Holt, surgeon, at Tottenham, and was afterwards brought to town, when he underwent the operation for popliteal aneurism: in this case the aneurism began to form in a very short time after the accident, and it was about a month after it that the operation was performed. The other case was as follows: A gentleman whom I was attending for a bad stricture in his urethra, in attempting to raise himself in bed upon his hands, felt something snap in the back of his right hand;

when I next visited him, he told me the circumstance, and desired me to look at a swelling upon his hand; placing my finger upon it, I felt a pulsating swelling; I tried what could be effected by pressure, but this did not succeed, and I found it necessary to open the tumour; it discharged a large quantity of arterial blood, in part coagulated, which proceeded from the radial artery, under the extensor tendons of the thumb; I tied that artery at the place at which the pulse is usually felt, and I tied it beyond the extensor tendons, between the thumb and fore finger. A punctured wound made into an artery, or a small incision, will occasion an extravasation of blood into the cellular tissue, which will render the operation for aneurism necessary for its cure.

OF THE DISSECTION OF ANEURISM.

When an aneurismal sac is opened and turned back, the cavity in which the blood is contained is not immediately exposed, but numerous layers of fibrous matter line the inner part of the sac, and form laminæ within each other; within which the fluid blood is contained; these laminæ are largest towards the sac, and form a portion of a lesser circle as they approach the fluid blood; these being removed, and the fluid or the recently coagulated blood, being spunged away, the orifice of the artery into the sac is directly seen; sometimes this orifice is small, and is formed by a portion of the circumference of the artery; and is sometimes large, the whole circumference of the artery having given way.

DIAGNOSIS OF ANEURISM.

Aneurism may be distinguished from other diseases by the following marks; if the aneurism be small, press the artery which leads to it, and you will empty the aneurismal bag; but if the aneurism has existed long, is very solid, and its pulsation not very strong, sit by the patient's side, observe carefully the size of the swelling; press your finger on the artery above, and the aneurism will sink under the pressure on the artery; upon giving up that pressure suddenly, a jet of blood rushes into the aneurismal bag, and raises it to its former height.

In a doubtful case of aneurism of the groin, Mr Brodie informed me every doubt vanished upon applying the stethoscope.

If a tumour, not aneurismal, has an artery of large size passing over it, a pulsation is produced which is liable to deceive. I was asked to see a glandular tumour in the neck, over which the carotid artery took its course, and which was easily distinguished from aneurism by the line of pulsation produced by the artery, whilst the lateral parts of the tumour had no pulsation. When a tumour is situated upon an artery, and derives pulsation from it, it may be distinguished from aneurism by elevating the swelling from the artery which deprives the tumour of its pulsation.

Pulsating tumours in the neck are common, and may be distinguished from aneurism, by desiring the patient to make an effort to swallow. Carotid aneurisms generally do not move with the larynx or trachea: other pulsating tumours in the neck are, for the most part, connected with the thyroid gland, and obey the motions of the air tube in swallowing.

Patients should know that this disease, which is generally hopeless without operation, sometimes undergoes a spontaneous cure, for it is a great consolation for them to know this. I have known many examples of this change in aneurism, and will relate one of the most striking: George Bowie was admitted into Guy's Hospital, with an aneurism in the groin; when the aneurism had acquired considerable magnitude, as he was sitting by the fire in his ward, he suddenly felt a snap in the swelling; his leg and thigh became immediately swollen and useless, and the patients assisted him into bed. The pulsation in the swelling continued for four days, and then ceased; the swelling of the limb gradually subsided, and four months afterwards he was able to walk, with scarcely any lameness: I met him one day in the Square of the Hospital, and asking him how he was, he said, 'Sir, I am pretty well of my old complaint, but I have got something alive in my inside;' and upon applying my hand to his abdomen, I found a pulsating tumour: he died from the bursting of this aneurism into the abdomen. I examined him, and we have the parts preserved in the Museum of St Thomas's Hospital. The aneurism of the thigh had burst under the fascia lata, and the accumulated blood pressed the aneurism on the femoral artery, so as to interrupt the circulation. Both the iliac and upper part of the femoral artery were obliterated, and the blood found its course by the internal iliac vessels.

I have seen spontaneous cures of aneurism produced without any circumstance which would readily explain the cause: one case with Sir William Blizard, at Walworth; a case of popliteal aneurism;

and another of popliteal aneurism in Guy's Hospital. Mr Ford has published cases of this description; and Dr Baillie has met with similar instances. I once saw, in Guy's Hospital, a man who had an aneurism in the thigh, which had existed several years; which still retained its pulsation, but had ceased to increase, although it had not diminished: this man died of some other disease; and upon examination, I found it to be aneurism produced by the general dilatation of the coats of the artery.

ON THE TREATMENT OF ANEURISM.

Little done by medical treatment. — From the medical treatment of this disease, I must confess that I have seen but little advantage. Mr Brown, a surgeon, who had an aneurism of the aorta, was exceedingly strict in his diet, and in his exercise; but he lived only a very few months. A gentleman, who had an aneurism of his aorta, took four ounces of food three times a day, and refrained almost entirely from exercise; and although he began this plan in August, almost as soon as the disease was distinctly discovered, yet he died in the following February. The result of my observation is, that two measures only are useful; the one abstraction of blood from the arm, when the pulse is hard and full, from which I have seen undoubted benefit arise: the other, the administration of the carbonate of soda, in considerable doses, which, with entire rest, seem to prevent the increase of the swelling; but the soda is at last obliged to be abandoned, on account of its producing petechiæ: the irritability of the body is often so increased by an antiphlogistic treatment, that the quickness of the pulse which follows, does as much injury as the natural force of circulation.

LECTURE XV.

ON THE OPERATION FOR ANEURISM.

As aneurism leads to a gangrenous state of the limb, as well as to the bursting of the aneurismal bag, and subsequently hæmorrhage; it therefore becomes necessary, in order to preserve the life of the patient, that an operation should be performed, to check the progress of the disease. The operation for it is one of the greatest triumphs of our science; it is founded upon a knowledge of anatomy, upon the best physiological principles, and upon a thorough acquaintance with the nature of the disease. To that stupendous genius Mr Hunter, is mankind indebted for it; before his time an operation had been performed so rarely successful, that surgeons doubted whether it were best to perform it, or to amputate; and I can recollect seeing a man, who regularly came to St Thomas's Hospital to show himself, because he was thought to be a curiosity in having recovered from the operation for popliteal aneurism; this was forty years ago; the operation then consisted in applying a tourniquet upon the limb, in making an extensive incision into the aneurismal bag in the direction of the artery: in removing the layers of fibrin accumulated in the sac with the hand, and in spunging the bag clean. The tourniquet being then loosened, the openings from the artery were seen; a probe was passed into the orifice towards the heart, and a ligature was tied round that part of the artery; a probe was carried into the orifice towards the foot, and a ligature was made to surround that portion of the artery: thus a

ligature was applied above and below the opening in the sac, and the wound was attempted to be healed as any other in which ligatures are introduced: high constitutional irritation followed this operation, extensive suppuration succeeded, hæmorrhages were frequent consequences, and its issue was generally unsuccessful.

The plan of Mr Hunter had extensive scientific, and pathological views; the principle of his operation was, to direct the blood into new channels; and, instead of disturbing the diseased parts, to leave them to be absorbed by the processes of nature. The whole of his operation, then, in principle, consisted in tying the artery which led to the aneurism, in preventing it any longer from receiving blood from the heart, and in directing the blood into new and anastomosing channels.

OF THE OPERATION FOR POPLITEAL ANEURISM.

It is proper that this operation should be performed before the foot and leg be much swollen. If the patient be of full habit, I find there is no objection to taking away blood from the arm, two or three days prior to the operation, and the patient for a week before should avoid any stimulating food.

Instruments required. — The instruments required are, a common scalpel, a silver knife, a curved-eyed probe of half the usual length of probes, threaded with Dutch twine.

Place of incision. — The place of the incision is one-third of the length of the thigh from the anterior superior spinous process of the ilium, to the internal condyle of the os femoris. Mr Hunter performed it just above the tendon of the triceps femoris; but the artery is more deeply seated there,

and has more vessels opening from it which are in danger of injury.

Position of the patient. — The patient is placed upon a table of convenient height, in the recumbent posture, with his shoulders a little elevated, and his leg slightly bent to relax the sartorius muscle.

Length of the first incision. — The incision is to be four inches long; its direction that of the sartorius muscle, and just upon its inner edge. Any large branch of the saphena vein is to be avoided, and the first incision is to expose the fibres of the sartorius.

The second incision is to separate the inner edge of the sartorius from the adductor longus femoris, and this merely divides the cellular tissue. The sartorius is then gently drawn outwards, and the sheath of vessels becomes exposed, in which the artery, being more superficial than the vein, may be felt pulsating. A third incision opens the sheath, and this must be done with caution, as the sheath is to be divided over the artery. A septum is found between the artery and vein. The point of the silver knife may be here most safely used, to farther open the sheath, and to admit the probe. The probe is to be introduced under the artery with great care, to avoid injury to the vein, and to exclude any branch of nerve, as I have known the saphenus nerve included in the ligature, and numbness produced in the course of the saphena vein. The probe being brought out at the wound, the ligature is then left under the artery. All this is to be effected with as little disturbance to the artery as possible. The ligature is to be then tied, first passed through twice, and then only once in making the knot secure. If any small vessel bleeds in the operation above the site of the ligature upon the artery, let it be immediately secured by a thread; as, from the interruption to the circulation in the prin-

cipal vessel, the smallest artery is apt to bleed freely. Directly as the ligature is made secure, the pulsation in the tumour generally ceases; I say generally, because I have known an obscure pulsation remain through the influence of anastomosing vessels.

Dressing the wound. — When the ligature has been securely tied, cut off one of its ends, and leave the other hanging from the centre of the wound. Bring the edges of the skin exactly together, and secure them by adhesive plaster, leaving small interstices to permit the escape of discharge. Do not apply any bandage, and let the patient be carried to bed in the recumbent posture. Place the limb in a slightly-bent position, rather on its outer side, and the foot is to be wrapped in flannel.

Other modes of operating. — These are the steps of the operation; attempts have been made by ingenious surgeons to improve upon this mode of performing it, and one of the best proposals for this purpose was made by Mr Cline. As hæmorrhage sometimes occurs at the time the ligature separates, he proposed to prevent ulceration of the artery by using a broad ligature, tying it upon a piece of cork, and removing it after some days, before ulceration usually begins. The first operation succeeded; but he afterwards found the introduction of an extraneous body produced too much irritation.

Mr Crampton's. — Mr Crampton, of Dublin, used an ingenious instrument, which he called the presse artere, with the same view.

Dr Jones's. — Dr Jones (author of an excellent work on the natural means of suppressing hæmorrhage) having found that small ligatures cut the inner coat of an artery without injury to the external, advised that the ligature should be tightly tied, and then removed, the artery being left to adhere when it was exposed. I tried this plan in two instances.

Experiments. — The first was in a case of popliteal aneurism in Guy's Hospital. I put a ligature around the femoral artery at the usual place; and tying it very tight, after thirty hours I loosened it. The pulsation in the aneurism returned after half a minute with the same force as prior to the operation; I, therefore, again tightened the ligature, and suffered it to remain forty-two hours longer; after seventy-two hours I removed the ligature, and the pulsation did not return; thirteen days after, as I entered the square of the Hospital, one of my dressers informed me, the man had hæmorrhage from the femoral artery. I visited him immediately, and found it to be so; a tourniquet was applied just above the wound, the hæmorrhage did not return, and the patient recovered.

The second case was an aneurism of the radial artery, produced by a wound; I removed the ligature twenty-four hours after it had been applied, but the pulsation returned; I made an incision into the tumour, applied a ligature upon the artery above and below the openings into the sac, and the aneurism was cured.

Mr Abernethy's. — Mr Abernethy proposed a new and very ingenious mode of operating for this disease, by placing two ligatures upon the artery, and dividing the vessel between them; thus reducing the extremity of the vessel nearest to the heart, to the state in which it is in a stump. I have often performed this operation, and very successfully; and I think it ought to be adopted in all cases in which the artery is much disturbed in the operation, and separated from the surrounding cellular tissue; as the division of the artery enables it to retract into the cellular membrane above; it is liable, however, to one objection, viz, to the ligature escaping from the artery soon after its application; this happened

to Mr Cline, sen. in St Thomas's Hospital, and to myself in Guy's Hospital; both ligatures came off the artery as I divided it, but I immediately replaced them.

Of cutting off both ends of the ligature. — It has been recommended to cut off both ends of the ligature close to the knot, in the hope that the wound would heal over it, and that it would remain without producing inflammation; but experience has shown that it separates by ulceration, and often produces a considerable degree of irritation.

OF THE AFTER TREATMENT OF THE PATIENT.

Application of flannel. — A piece of flannel is to be placed around the limb, or a warm stocking to be worn, to preserve the warmth of the limb, for there is danger of gangrene in cold weather; the heat of the foot is generally two degrees more than that of the sound side; but if it be exposed to the influence of low temperature, it is easily robbed of the heat which is necessary to its preservation. Before I learned this, I had operated upon a young gentleman during the winter, who, when I visited him in the evening, complained of great coldness, numbness, and a sense of weight in his foot; this induced me to look at the limb, and I found that the foot was quite cold, and that the blood was stagnant in it. I sat down by the bedside of the patient, and rubbed his leg with a warm flannel till heat was restored to the limb; and ever since that time I have wrapped the limb in a piece of flannel, and sometimes put bottles filled with hot water to the feet, if the weather be particularly cold.

For a few days after the operation, a considerable degree of constitutional irritation is produced; and I have in two or three instances known reten-

tion of urine occur, rendering the introduction of the catheter necessary. The medicine best suited to the patient is a simple saline draught with sulphate of magnesia; and opium may be administered, if there be any considerable degree of irritability. Great care must be taken that the patient does not rest too much upon his heel, as a gangrenous spot is apt to form there, if that be permitted; the patient must make no effort to use the limb, as any disturbance of the sartorious muscle prevents the ready adhesion of the wound. Every other day will be sufficient for the reapplication of the dressings; and for the first four days, at least, they should not be disturbed.

Separation of the ligature. — Between the eleventh and fifteenth day the ligature usually separates, but I have known a broad ligature twenty-seven days in ulcerating. Nothing must be done to assist the separation of the ligature, leave it entirely to a natural process. For three or four days after the ligature has separated, carefully guard the patient from raising himself in bed, for the following reason.

Case. — A sailor endeavouring to push his pocket knife through a cable, which was placed between his thighs, the knife slipped, and entered his femoral artery; a profuse hæmorrhage ensued; a tourniquet, made by a handkerchief and stick at the moment, was put around the limb, and he was brought to Guy's Hospital. I put a ligature above and below the wound in the artery, and on the fourteenth day these ligatures separated: at twelve o'clock the same day he was sitting in his bed washing his hands, when a gush of blood took place from the wound. A tourniquet was directly applied by the dresser, and I was sent for. The hæmorrhage proceeded from the portion of the artery nearest the heart, upon which I placed a ligature, which rendered it

necessary for the man to keep his bed for three weeks longer; but he ultimately recovered: this shows the necessity of perfect stillness on the part of the patient, whilst the ligature is separating and the adhesion is remaining feeble.

Mode in which circulation is carried on. — After this operation the circulation is carried on principally by the arteria profunda; its branches communicate with the articular arteries of the popliteal, and with arteries sent to the knee by the anterior and posterior tibial; large branches in the sciatic nerve, sent off by the arteria profunda, communicate very freely with the popliteal artery, the articular of the knee joint, and with branches of the posterior tibial artery; the freedom of anastomosis now and then leads to a reproduction of an aneurism, of which you have all had an opportunity of seeing an instance during the present season in Guy's Hospital. The femoral artery had been tied last year by Mr Key, and the man was discharged cured; but during the present season he has returned with a very painful tumour in the ham, having an obscure pulsation in it, the flexor muscles of the knee were extremely rigid, and the man's health was giving way so rapidly, that I was obliged to amputate the limb, and a large artery which passed to the tumour was obliged to be secured nearly in the situation usually occupied by the femoral artery.

Subsequent gangrene. — I have known the operation fail in three or four instances from gangrene of the leg which demanded amputation.

Hæmorrhage. — I have also seen it several times fail from hæmorrhage, but more frequently formerly than of late years; now the principles of the operation are so well understood.

This, however, occurs in some instances, on account of the artery not being closed at the time the

ligature separated, in consequence of which the patient has been destroyed by hæmorrhage; this arose from a deficiency of power in the constitution, so that the necessary degree of inflammation had not been produced, or from a diseased state of the artery itself.*

* A case of this nature occured to Mr Bransby Cooper, of which the following are the particulars:

On the 9th of June, 1823, Mr Gaitskell, of Rotherhithe, was requested to see J. C. Esq. æt. 49, on account of the sudden appearance of a swelling on the upper part of the left thigh, three inches below Poupart's ligament; which proved to be a femoral aneurism. Sir Astley Cooper was consulted, and as but little pulsation existed in the tumour, he thought a spontaneous cure might take place, and recommended that the patient should adopt those measures most likely to assist the efforts of nature. On the 21st of June, however, Mr G., whilst in the act of raising himself in bed, felt something give way in the thigh; this was immediately followed by a rapid increase of the swelling, which soon extended to Poupart's ligament. Sir A. Cooper was sent for, but being out of town, his nephew (Mr Bransby Cooper) attended for him, and after a consultation with Mr J. H. Green, a ligature was placed on the external iliac. The operation was performed with great facility in the usual manner.

Every thing went on favourably for eighteen days after, when a slight arterial hæmorrhage took place from the wound, which returned at intervals on the 19th, 20th, and 21st days; when it entirely ceased for forty-eight hours. The wound appeared healed, excepting near the ligature, around which a glassy granulation protruded. On the 24th, 25th, and 26th days, the bleedings returned oftener and more violently than before, but were checked for a time by pressure and cold applications; the patient became much exhausted from the repeated loss of blood, and the wound again opened. On the 27th, a profuse haæmorrhage supervened, which separated the ligature, and an hour after the patient expired.

DISSECTION.

The artery was completely divided, and the extremities were above an inch apart. The superior portion was slightly glued to the psoas muscle by adhesive matter; it contained a small

Case. --- Mr Birch lost a patient in St Thomas's Hospital, from the femoral artery being tied too near to the arteria profunda to allow of adhesion of the inner coats of the artery, and consequently to prevent hæmorrhage.

OF ANEURISM OF THE ANTERIOR TIBIAL ARTERY.

If this disease be placed at the upper part of the leg, the same operation is required for it as that which is performed for popliteal aneurism. Mr Lucas, sen. surgeon of Guy's Hospital, had a patient with anterior tibial aneurism seated a little below the head of the fibula. He performed the operation of tying the femoral artery, and the pulsation in the aneurism ceased, and the swelling for a time subsided. The case did not ultimately recover, for a slough took place of the aneurismal sac; but the failure arose not from the operation being inappropriate, but from a very unhealthy constitution. Mr Henry Cline had a case of this disease upon the upper part of the foot, and he tied the anterior tibial artery at the lower part of the leg, but the pulsation in the aneurism continued when the boy quitted the Hospital. It will be, therefore, right to tie the artery by opening the sac, so as to secure it above and below the aperture, if the aneurism be seated low down in the limb, as the anastomosis with the planter arteries is exceedingly free.

loose coagulum, but there was not the slightest appearance of any adhesive process internally. The inferior portion was also open, but did not contain any coagulum. The coats of the artery were extremely thin and semi-transparent, having much more the character of the coats of a vein than an artery.—T.

OF ANEURISM OF THE POSTERIOR TIBIAL ARTERY.

I have tied the femoral artery for an aneurism, under the calf of the leg, in the posterior tibial artery, in a man of the name of Fox, aged sixty-nine years, who proceeded quite favourably.

OF INGUINAL ANEURISM.

The femoral artery sometimes forms an aneurism just opposite the hip-joint and below Poupart's ligament. I have also seen it at the origin of the arteria profunda; but if the aneurism be placed any where between the groin and the middle of the thigh, it is best to tie

THE EXTERNAL ILIAC ARTERY.

Mode of operating. — The operation is performed as follows: The patient being placed in the recumbent posture on a table of convenient height, the incision is begun just above the abdominal ring, and is extended downwards in a semi-lunar direction to the upper edge of Poupart's ligament, and again upwards, to within an inch of the anterior and superior spinous process of the ilium. This incision exposes the tendon of the external oblique muscle: in the same direction the above tendon is to be cut through, and the lower edges of the internal oblique and transversalis abdominis muscles are exposed; the centre of these muscles is then to be separated from Poupart's ligament; the opening by which the spermatic cord quits the abdomen, is thus exposed, and the finger passed through this space is directly applied upon the iliac artery above the origin of the epigastric and circumflex ilii arteries. The iliac

artery is placed upon the outer side of the vein; and the next step of the operation consists in gently separating the vein from the artery by the extremity of a director, or by the end of the finger. The iron curved aneurismal needle is then passed under the artery, and between it and the vein from without inwards, carrying a ligature, which being brought out at the wound, the needle is withdrawn, and the ligature is then tied around the artery, as in the operation for popliteal aneurism. One end of the ligature being cut away, the other is suspended from the wound, the edges of which are brought together by adhesive plaster, and the wound is treated as any other containing a ligature.

Amid the many cases of this operation which I have had occasion to perform, two of them have been in medical men, Mr J. of Stamford, and Mr C. of Worcester, both of whom are now living. One unfortunate case only occurred, in which I lost the patient from hæmorrhage, which took place on the fifteenth day after the operation. I applied another ligature, but the man sunk from the debility consequent on the loss of blood.

THE INTERNAL ILIAC ARTERY

Has been tied by Mr W. Stevens, surgeon, in the island of Santa Cruz, for the cure of a large aneurism of the left glutœal artery. The following account of the operation has been published in the fifth volume of the Medico-chirurgical Transactions:

Operation. — An incision, about five inches in length, was made on the left side, in the lower and lateral part of the abdomen, parallel with the epigastric artery, and nearly half an inch on the outer side of it. The skin, the superficial fascia, and the three thin abdominal muscles, were successively divided;

the peritoneum was separated from its loose connexion with the iliacus internus and psoas muscles; it was then turned almost directly inwards, in a direction from the anterior superior spinous process of the ilium, to the division of the common iliac artery. In the cavity which I had now made I felt for the internal iliac, insinuated the point of my fore-finger behind it, and then pressed the artery betwixt my finger and thumb. Dr Lang now felt the aneurism behind; the pulsation had entirely ceased, and the tumour was disappearing. I examined the vessel in the pelvis; it was healthy and free from its neighbouring connexions; I then passed a ligature behind the artery, and tied it about half an inch from its origin. The tumour disappeared almost immediately after the operation, and the wound healed kindly. About the end of the third week the ligature came away, and in six weeks the woman was perfectly well.

The case in which I put a ligature on the aorta, has been published in the first part of the Surgical Essays. I shall, therefore, only give a short extract from it here.

LIGATURE ON THE AORTA.

Case. — Charles Hutson, a porter, æt. 38, was admitted into Guy's Hospital, on the 9th of April 1817, for an aneurism in the left groin, situated partly above and partly below Poupart's ligament. The swelling was very much diffused, and pressure upon it gave considerable pain. On the third day after he had been in the Hospital, the swelling increased to double its former size, and extended from three to four inches above Poupart's ligament to an equal distance below it, and was of great magnitude. Just below the anterior and superior spinous process of

the ilium, a distinct fluctuation could be felt in the aneurismal sac, so that the blood had not evidently yet coagulated; and the peritoneum was carried far from the lower part of the abdomen, in such a manner as to reach the common iliac artery, and to render an operation impracticable without opening the cavity of the peritoneum. I therefore was extremely averse to perform an operation, and determined to wait and see if any efforts would be made towards a spontaneous cure.

He was occasionally bled, kept perfectly quiet, and pressure was applied on the tumour. June 19th, a slough was observed on the exterior part of the swelling below Poupart's ligament, which, in part, separated on the 20th, and he had some bleeding from the sac, but it was easily stopped by a compress of lint, confined on the part by adhesive plaster. On the 22nd, after some slight exertion, he bled again, but not profusely. 24th, the bleeding again recurred, but stopped spontaneously. 25th, about half past two o'clock, in consequence of a sudden mental agitation, bled profusely, and became so much exhausted, that his fæces passed off involuntarily; but Mr Key, then my apprentice, succeeded in preventing immediate dissolution by pressure. At nine o'clock the same evening I saw him, and found him in so reduced a state, that he could not survive another hæmorrhage, with which he was every moment threatened. Yet still anxious to avoid opening the abdomen, to secure the aorta near to its bifurcation, I made an incision into the aneurismal sac, above Poupart's ligament, to ascertain if it were practicable to pass a ligature around the artery from thence. On introducing my finger, I found that the artery entered the sac above and quitted it below, without there being any intervening portion of vessel; I, therefore, was obliged to abandon that mode of ope-

rating; and as the only chance which remained of preventing his immediate dissolution, by hæmorrhage, was by tying the aorta, I determined on doing it. The operation was performed as follows:

Operation.—The patient's shoulders were slightly elevated by pillows, in order to relax, as much as possible, the abdominal muscles; for I expected that a protrusion of intestines would produce embarrassment in the operation, and was gratified to find that this was prevented by their empty state, in consequence of the involuntary evacuation of the fæces. I then made an incision, three inches long, into the linea alba, giving it a slight curve, to avoid the umbilicus: one inch and a half was above, and the remainder below the navel. Having divided the linea alba, I made a small aperture into the peritoneum, and introduced my finger into the abdomen; and then with a probe-pointed bistoury enlarged the opening into the peritoneum to nearly the same extent as that of the external wound. During the progress of the operation, only one small convolution of intestine projected beyond the wound.

Having made a sufficient opening to admit my finger into the abdomen, I passed it between the intestines to the spine, and felt the aorta greatly enlarged, and beating with excessive force. By means of my finger nail, I scratched through the peritoneum on the left side of the aorta, and then gradually passed my finger between the aorta and spine, and again penetrated the peritoneum, on the right side of the aorta.

I had now my finger under the artery, and by its side I conveyed the blunt aneurismal needle, armed with a single ligature behind it; and Mr Key drew the ligature from the eye of the needle to the external wound, when the needle was withdrawn.

The next circumstance, which required consider-

able care, was the exclusion of the intestine from the ligature, the ends of which were brought together at the wound, and the finger was carried down between them, so as to remove every portion of the intestine from between the threads: the ligature was then tied, and its ends were left hanging out of the wound.

During the operation the fæces passed involuntarily, and the patient's pulse, both immediately and for an hour after the operation, was 144 in a minute. I applied my hand to his right thigh, immediately after the operation, and he said that I touched his foot, so that the sensibility of the leg was very imperfect.

The omentum was drawn behind the opening as far as the ligature would admit, so as to facilitate adhesion; and the edges of the wound were brought together by means of a quilled suture and adhesive plaster.

He remained very comfortable until the following evening, when he vomited, and his fæces passed off involuntarily. 27th, Seven o'clock A.M. had passed a restless night, and had vomited at intervals; pulse 104, weak and small; pain in his head; great anxiety of countenance; very restless, and his urine dribbled from him. He gradually sunk, and died at eighteen minutes after one o'clock, having survived the operation forty hours.

DISSECTION.

No peritoneal inflammation, but at the edges of the wound, which were glued together by adhesive matter, excepting at the part at which the ligature protruded. The thread had been passed around the aorta, about three quarters of an inch above its bifurcation, and rather more than an inch below the

part at which the duodenum crosses the artery; it had not included any portion of omentum, or intestine. Upon carefully cutting open the aorta, a clot, of more than an inch in length, was found to have sealed the vessel above the ligature; below the bifurcation, another, an inch in extent, occupied the right iliac artery; and the left was closed by a third, which reached as far as the aneurism: all were gratified to observe the artery so completely shut in forty hours. The aneurismal sac, which was of a most enormous size, reached from the common iliac artery to below Poupart's ligament, and extended to the outer part of the thigh. The artery was deficient from the upper to the lower part of the sac, which was filled with an immense quantity of coagulum.*

ANEURISM OF THE CAROTID.

I have twice performed the operation of tying the common carotid, on account of the existence of aneurism; and as both these cases have been already published in the first volume of the Medico-Chirurgical Transactions, it will be only necessary to give a short account of them here, and of the mode in which this operation is to be performed.

Case.—The first case is that of Mary Edwards, æt. 44. The swelling occupied two-thirds of the right side of the neck, pulsated very strongly, and the integument at the most prominent part of the tumour appeared very thin. It had existed six

* In an operation which I lately performed of tying the external iliac artery much above Poupart's ligament, I think I could with little difficulty have reached the aorta, by turning up the peritoneum without dividing it; and should I again wish to put a ligature on the aorta, I should prefer this method to the one I have before adopted.

months previous to the operation, which was performed as follows: On November 1, 1805, I made an incision, two inches long, on the inner edge of the sterno-mastoid muscle, from the inferior part of the tumour to the clavicle, which laid bare the omo and sterno-hyoideus muscles, which being drawn aside towards the trachea, exposed the jugular vein. The motion of this vein produced the only difficulty in the operation; as, under the different states of breathing, it sometimes presented itself to the knife tense and distended, and then as suddenly collapsed. Passing my finger into the wound, to confine that vein, I made an incision upon the carotid artery, and having laid it bare, I separated it from the par vagum, and introduced a curved aneurismal needle under it, taking care to exclude the recurrent nerve on the one hand, and the par vagum on the other. The two threads were then tied about half an inch asunder, being the greatest distance to which they could be separated: on account of the short space, I did not divide the artery. As soon as the threads were tied, all pulsation in the tumour ceased, and the wound was superficially dressed.

Immediately after the operation she was seized with a severe fit of coughing, which continued half an hour, when she became more tranquil, and slept six hours during the following night. She continued in a favourable state until the 8th, when it was observed that her left arm and leg were paralytic: she was restless, but had not any pain in the head. 9th. Could not swallow solids, and felt occasional pricking pain in the wound. 11th. Power of motion of the left arm returned, and she appeared going on favourably. 12th. The two ligatures came away with the intervening portion of artery. She went on well until the 17th, the tumour reducing, and the wound healing; when the wound again

opened, the tumour increased, and was painful; she had a violent cough, great difficulty in swallowing, and a high degree of constitutional irritation. From this time she gradually got worse, and died on the 21st.

DISSECTION.

Inflammation of the aneurismal sac, which contained coagula and pus: the inflammation extended nearly to the basis of the skull, in the course of the par vagum. The glottis was almost closed, and the internal surface of the trachea was inflamed, fibrin adhering to its mucous membrane. Owing to the pressure of the tumour, the pharynx would scarcely admit a bougie of the size of a goose-quill. The cause of her death then was the inflammation of the aneurismal sac and of the adjacent parts, by which the size of the tumour became so increased as to press on the pharynx and prevent deglutition, and upon the larynx, so as to excite coughing, and to impede respiration.

Case. — Humphrey Humphreys, æt. 50, an iron-porter, had an aneurismal tumour on the left side of the neck, about the size of a walnut, extending from the angle of the jaw to the thyroid cartilage. He had observed it about six months previous to the operation, and it was accompanied with violent pain in the head, and a sense of pulsation in the brain. When the sac was emptied by pressure on the artery below, the tumour regained its original size by one contraction of the heart.

The operation was performed at Guy's Hospital, on the 22nd of June, 1808, in the same manner as in

the preceding case, only that the artery was divided between the ligatures. The pulsation in the tumour did not, however, entirely cease; but the pain in the head subsided immediately, and did not again return.

The patient had scarcely an unpleasant symptom following the operation; the wound healed, as far as the ligatures would permit, by adhesion; the ligatures came away on the 14th and 15th of July; the tumour gradually diminished, but an obscure pulsation existed in it until the beginning of September, when it could not be felt. The wound closed slowly, and the man returned to his employment on the 14th of September.

SUBCLAVIAN ANEURISM.

The operation for tying the subclavian artery was first successfully performed by Dr Post, of New-York, and since by Mr Lister, Mr Todd, Mr Gibbs, Baron Dupuytren, Mr Key, and others. The following were the steps of the operation in Mr Key's case:

The patient being laid upon an inclined plane, formed by the lithotomy table, so that the light from a large sky-light could be thrown into the triangular space in which the artery lies imbedded; I drew the integuments down over the clavicle, and cut freely upon the bone, beginning the incision about half an inch over the clavicular portion of the sterno-mastoid, and continuing it outwards for about three inches. The integuments being relaxed, the incision became raised about a third of an inch above the clavicle, and exposed the platysma myoides, which was divided to the same extent. Several turgid veins were now exposed upon the cervical fascia, to avoid which was impossible; they were

therefore divided, and about three ounces of blood lost; one, larger than the rest, Mr Travers secured, to prevent any obstruction in the aftersteps of the operation. The outer layer of the cervical fascia was then divided by the knife, and the loose cellular texture, enveloping the glands of the neck, being detached by the finger, the omohyoideus muscle was laid bare; a little farther dissection then discovered the artery to the finger; but the depth of the angle, in which it was enclosed, rendering it impossible to pass a ligature under it in so confined a space; about half an inch of the sterno-mastoid was divided, which gave considerable room. The artery was then exposed by means of a director, and the aneurismal needle was readily conveyed under it, by passing it from below upwards. The method I adopted to prevent any difficulty in passing the ligature under the vessel, is detailed in the Medico-Chirurgical Transactions. It is now a twelve-month since the operation was performed; the pulse in the radial artery is scarcely perceptible, although the man enjoys very good use of the limb, and is otherwise in perfect health.

ANEURISM OF THE BRACHIAL ARTERY.

I do not remember to have seen a case of aneurism from disease in the brachial artery; but I have seen several at the elbow joint, arising from a wound of this artery; and as the treatment is the same in each, I will describe the operation which is required:—An incision is made in the middle of the arm between the shoulder and elbow, on the inner edge of the biceps flexor cubiti, of three inches in length, which directly exposes the brachial artery, its vena comites, and the median nerve: the artery is to be a little dissected from the nerve and veins, and then

a probe is to be carried under the artery, armed with a ligature; the probe is to be withdrawn, leaving the ligature under the vessel; the ligature is then to be secured, as in the former operations, with as little disturbance to the artery as possible; one end of the thread is to be removed, whilst the other is suffered to remain between the edges of the wound, which are to be nicely adjusted with adhesive plaster. It is better not to make an incision upon the artery at the elbow joint, as most important parts are divided, and constitutional irritation runs so high as to occasion the destruction of life, as the following case explains:

Case. — One of our young gentlemen at Guy's Hospital, in bleeding a patient, recently admitted for an accident, had the misfortune to prick the artery; the jet of blood, its arterial colour, and the quantity lost in a short time (being thirty-seven ounces,) immediately informed him of the nature of the injury. He bound up the arm as tightly as the patient could bear, and succeeded in suppressing the hæmorrhage; but, on the fourth day, the tightness of the bandage produced so much pain, that the patient could bear it no longer, and he requested that it might be somewhat loosened; but so soon as this was done, the bleeding was renewed, and one of the surgeons of the Hospital was sent for; he made an incision upon the artery at the elbow joint, where it had been injured; the operation was exceedingly tedious and difficult, but at last the artery was secured above and below the opening; violent constitutional irritation succeeded, and, on the eighth day from his being bled, the man expired. The preparation taken from this man's arm is preserved in St Thomas's Hospital.

Old operation sometimes proper. — When this aneurism acquires very great magnitude, it is proper to

perform the old operation. I lately saw Mr Morgan, surgeon of Guy's Hospital, perform this operation easily and adroitly, in a case of large aneurism.

ANEURISM OF THE ULNA ARTERY.

I have seen only one case of aneurism of the ulna artery from disease; it was in a patient of Mr Chandler's, in St Thomas's Hospital; the aneurism was seated where the artery dips under the pronator radii, teres, and flexor muscles of the hand. Mr Chandler tied the artery above the swelling; it was an extremely difficult and tedious operation, and it would have been much better to have tied the brachial artery, either in the middle of the arm, or to have opened the aneurismal sac, and to have tied the artery above and below its opening. The patient died from the constitutional irritation resulting from this operation.

In aneurism of the ulna artery, situated at the wrist, it is right to open the sac, to tie the artery above and below the opening, taking care to exclude the ulna nerve, which closely accompanies the artery.

In aneurisms of the radial artery at the wrist, which are frequently occurring by wounds from glass, the aneurismal sac must be opened, and the artery tied above and below the opening. Mr W. Cooper, formely surgeon at Guy's Hospital, in performing this operation, found the upper portion of the radial artery obliterated, and that the aneurism was supported by regurgitation from the hand, from the free anastomosis with the ulna artery.

OF ANEURISM OF THE SCALP.

Those which I have witnessed are as follows: — an aneurism of the posterior aural artery, in a pa-

tient of Mr Fry, surgeon, at Dursley, Gloucestershire, which had been produced by a blow from her husband. I opened the sac, and was compelled to tie not only the vessel which led into the sac, but numerous others, entering in all parts of the circumference of the swelling.

I have seen several cases of temporal aneurisms from arteriotomy in that vessel. One in Mr Hensleigh, a medical student. I opened the sac, secured the temporal artery at its lower part, and was then obliged to secure many others entering the circumference of the sac, which had been excessively dilated. One case I saw from Mr Toulmin, of Hackney, produced by striking the temple against the corner of a dining table.

A young lady, whom Mr Cline and myself have visited in consultation, has a large pulsating tumour in the forehead, above the eyebrow, the cause of which is unknown. In this case I propose to make a circular incision around the sac to the bone, to divide all the vessels which feed it, and then to make use of pressure upon it.

The operation best calculated to cure aneurisms of the scalp is to cut directly across them, and to make use of pressure to stop the bleeding, to prevent the course of the blood through the swelling, and to produce adhesion of the sides of the sac.

Aneurisms are to be prevented after arteriotomy by the complete division of the vessel.

OF THE ANEURISMAL VARIX.

When the brachial artery is punctured with the lancet through the vein in bleeding, an adhesion is sometimes produced between the one and the other; and the blood, flowing from the artery into the vein, causes an enlargement of the latter, opposite the el-

bow joint. The swelling is called aneurismal varix, from the enlargement of the vein, and from its connexion with the artery. The swelling of the vein acquires the size of a pigeon's egg, and then it usually ceases to increase. There is a pulsation in the swelling, with a thrilling sensation, and a hissing noise. If the artery be compressed above, the swelling becomes flaccid and can be emptied of its blood; but if the arm be compressed below the swelling, the pulsation continues, and the size of the swelling remains unaltered. The brachial artery, above the varix, becomes enlarged, owing to the greater quantity of blood which it conveys.

The swelling of the vein proceeds to the size which I have mentioned, and then becomes stationary. A woman, with this altered state of the circulation, used frequently to exhibit her arm to the students for many successive years, and it seemed to remain annually the same.

No operation has been required for this disease, in any case which I have seen of it, as it is not a dangerous state, either to the life or even to the arm. It renders the arm weaker, and nothing more serious arises from it.

Case. — Mr Atkinson, a most respectable surgeon at York, sent me an account of a case, in which an operation had been performed for this disease, and it proved fatal.

Treatment. — When the accident has recently occurred, it may be cured by the following plan.

Case. — A young lady was brought to my house by the surgeon who had the misfortune to prick the brachial artery in bleeding. The wound had healed, but an aneurismal varix followed, of the size of a pigeon's egg, attended with strong pulsation, a thrill, and a hissing noise. I ordered it to be compressed with a dossil of lint and a roller; but it did

not succeed in subduing it. I then directed that a circle of iron should be put round the arm, with a pad, which could be screwed down on the brachial artery, in the middle of the arm, between the shoulder and elbow joint. This she bore without much suffering, and gradually the swelling at the elbow subsided, and pulsation in the brachial artery and in the tumour could be no longer perceived. As the gentleman, who attended the case with me, was well acquainted with Mr Abernethy, he took the young lady to Mr Abernethy, at my request, to show him the cure of this disease.

LECTURE XVI.

ON HYDROCELE.

Definition. — Hydrocele is an accumulation of fluid in the tunica vaginalis testis, producing a pyriform, fluctuating, and generally a transparent swelling in the scrotum.*

Symptoms. — In this disease the symptoms are as follow: a swelling begins about the testis, unattended with pain, and is usually observed only by accident. It is at first flaccid, and the fingers readily sink through it, so that the testis can be distinctly felt. As it increases, the swelling becomes tense, and conceals the testis. It then assumes a pyriform shape, the largest part of the swelling is opposite to the testis, and as it rises towards the abdominal ring, its diameter gradually lessens. It is generally unattended with pain. Some few of the vessels of the scrotum are enlarged, but the skin does not appear to be inflamed, and the patient suffers no inconvenience but from its weight and its magnitude: his general health being unaffected.

Transparency. — Upon accurate examination of the swelling, it is found to be transparent; and, as some surgeons deny the truth of this, it must arise from their not understanding the mode of making the examination. The room is to be darkened; the patient holds a candle, burning brightly, close to the side of the scrotum, and the surgeon grasps the pos-

* The term Hydrocele applies to any watery tumour; but it is now limited by surgeons to hydrocele of the tunica vaginalis, and to hydrocele of the spermatic cord.

terior part of the swelling, so as to render its fore part as tense as is possible; then the surgeon, looking at the swelling from the side opposite to the candle, and placing his left hand on the fore part of the scrotum, immediately discovers transparency. I have seen surgeons place a candle on one side, raise the scrotum, and look from the other, and say the swelling is not transparent; and in this way it scarcely ever will be. The strong light of the sun, falling directly on the part, answers equally well, in showing its transparency.

Fluctuation. — Hydrocele has a distinct fluctuation, which may be observed in the most distant parts of the swelling, by pressing with the fingers at remote parts. However, when it is excessively distended it feels hard.

Situation of the testicle. — The testis is generally placed two thirds of the swelling downwards, and at the posterior part of the scrotum; pressure at that part gives the sensation of squeezing the testis, and when the swelling is transparent the testis may be seen there.

Hydrocele is a very moveable swelling; — if it does not distend the part much in the course of the spermatic cord, it bends easily upon the abdomen, and moves readily in all directions.

Such is the usual character of the disease; but sometimes, and not unfrequently, it is the result of inflammation of the testis, when it is preceded by pain, redness, hardness, and swelling of the part, which assumes more the form of the testis itself, and is less distinctly transparent.

Nature of the fluid. — The fluid which hydrocele contains resembles serum; like it, yellow and transparent; like it, coagulable by heat, by acids, and by alcohol: it coagulates in Port wine and in solutions of the sulphate of zinc, used as injections.

As this disease is subject to great varieties, it is necessary these should be particularly pointed out.

On both sides.—The disease sometimes exists on both sides of the scrotum, and when this happens the swellings must be cured in succession.

Testicle on the fore part.—The testis varies in its situation in this disease; it is sometimes glued to the fore part of the tunica vaginalis, and the serum is accumulated on each side of it. I was called to the following case:—A gentleman consulted a surgeon for a swelling in the scrotum, which he pronounced to be hydrocele. He put a trochar into it; no water followed, and he said 'I am mistaken; this is a solid enlargement of the testis, and it must be removed.' The patient, excessively alarmed at so severe a sentence, said he should require time to think of it, and another surgeon was consulted. When his clothes were loosened, venereal spots were observed upon the skin of the abdomen, and he had a node upon the tibia. Mercury and sarsaparilla were given him, and he got well of those symptoms. But the swelling remained in the scrotum, and was clearly an hydrocele, from its fluctuations and its transparency; but with the testis adhering to the anterior part of the tunica vaginalis. It was injected from the side instead of the fore part, and the patient perfectly recovered.

Result of inflammation.—When hydrocele is the result of inflammation of the testis, the water is accumulated (in consequence of an unnatural adhesion of the tunica vaginalis) above the testis, or below it, and upon either side.

In our collection at St Thomas's, we have a preparation of the tunica vaginalis giving way posteri-

orly to the pressure of the water, and forming a new and additional sac.

Two swellings. — Hydrocele sometimes forms two swellings, one in the scrotum, another at the abdominal ring, with a smaller swelling of communication between them: — this has much the appearance of hernia.

Two distinct hydroceles are sometimes formed upon the same side, of which the following is an example.

Case. — Mr Roberts, surgeon, of Malmesbury, in Wiltshire, consulted Dr Cheston, of Gloucester, respecting a patient of his who had hydrocele; and it was agreed that the water should be drawn off, which Mr Roberts did in Dr Cheston's presence; but they were both surprised to see a swelling remaining, half as large as at first, and which could not be emptied through the canula. The canula was therefore withdrawn, and soon after he was sent to London, where I saw him. I tapped the hydrocele, and a yellow serous fluid was discharged; but still half the swelling remained. I then darkened the room, ordered a candle, and examined the swelling, and which extended from the upper part of the testis to the abdominal ring: — it was very transparent. I therefore tapped it, and drew off a fluid like water, quite free from colour. I afterwards injected the lower hydrocele, and repeatedly tapped the upper swelling. This additional swelling was either hydrocele of the cord, or a hernial sac closed at its orifice.

We have two preparations, in the collection at St Thomas's Hospital, of a cyst growing between the tunica vaginalis and the tunica albuginea, upon the surface of the testis. I have seen another example of the same kind.

Communicates with the abdomen. — Hydrocele some-

times communicates with the abdomen: I have several times seen this circumstance in children; occasionally also in the adult. The following is an interesting case of the former. Mr Dobson, of Harlow, sent me a young gentleman with hydrocele, which communicated with the abdomen. I wrote to Mr Dobson to the following effect: 'Our first step must be to apply a truss, and obliterate the communication of the tunica vaginalis with the abdomen, and then we will inject the hydrocele.' Many months afterwards, Mr Dobson wrote me word that the truss had cured the hydrocele; for that, when the opening of the tunica vaginalis was obliterated by its pressure, the water became entirely absorbed. Where hydrocele communicates with the abdomen, and there is abdominal dropsy, it is very convenient to tap the patient through the scrotum.

Usual quantity of fluid. — The usual quantity of fluid in hydrocele is from six to eight ounces; but the largest hydrocele I have heard of was that of Mr Gibbon, the historian, from whom Mr Cline drew off six quarts of fluid: my colleague, Mr Morgan, also mentioned to me a case of very great accumulation of water in hydrocele.

Varies in appearance. — The fluid also varies in its appearance, although generally yellow, transparent, and saltish to the taste; it sometimes contains a quantity of white flaky matter, produced by chronic inflammation, which I have seen more in the hydrocele of West Indians than in others.

When produced under acute inflammation of the testis, the fluid is sometimes of a red colour, from a mixture of red particles of the blood.

I have also seen in the fluid of hydrocele loose cartilaginous bodies, of which we have a specimen in our collection at St Thomas's Hospital. When hydrocele has existed a great length of time, the

tunica vaginalis becomes thickened like parchment, and consequently opaque. Mr Warner found a tunica vaginalis ossified. There is also one in that state in the collection at Guy's Hospital; and Mr Beavers, a pupil of Mr Hey, of Leeds, gave me an example of one which he removed from the dead body.

DIAGNOSIS OF HYDROCELE.

Differs from diseased testicle. — Diseased testis is distinguishable from hydrocele by the latter being less heavy. The diseased testis is more flat on the sides than hydrocele, and more solid; pain is also produced by squeezing the testis; the epididymis is often capable of being felt as a distinct tumour; the cord may be traced with facility in the diseased testis; there is great vascularity of the scrotum; pain is felt in the loins generally; there is often the appearance of loss of health in disease of the testicle. A person comes into my room, and says, 'Sir, I have a disease in my testicle.' Looking at him, I am wont to say, if I observe the appearance of good health, 'I doubt that, Sir;' and upon examination, usually find it to be hydrocele.

From hernia. — From hernia it may be distinguished by the occasional return of the hernial swelling into the abdomen; by the dilatation of hernia in coughing; by hernia descending from the abdomen, and by hydrocele growing from below upwards. Hydrocele and hernia are, however, occasionally combined in the same individual, when the hydrocele is placed before the hernia. Hydrocele is sometimes met with below an adhering omental congenital hernia. Fluctuation and transparency are also diagnostic marks of hydrocele.

From varicocele. — Hydrocele may be distinguished

from varicocele by placing the patient in the recumbent posture in which varicocele disappears.

From hæmatocele. — From hæmatocele it is difficult to distinguish it; but I will state the differences in the two diseases, when speaking of hæmatocele: here it will only be necessary to say, that hæmatocele is generally the result of a blow.

OF THE CAUSES OF HYDROCELE.

Dropsy generally, and this disease in particular, is often said to arise from increased secretion or diminished absorption, by which the question of its cause is really avoided: — for myself, I believe a diminished absorption is very rarely the cause of true dropsy. We do sometimes observe a leg or an arm swollen from enlargement of the absorbent glands of the groin or axilla, but the swelling is very different to common œdema, being much more solid than dropsy usually is. But dropsical swellings generally are the result of an increased secretion from the arteries. The proofs of this are found in the increased vascularity of the membranous surface producing it, seen in the living or injected in the dead state; also in the changes in the membranes, produced in long continued dropsies; and in the quickness with which hydrocele succeeds inflammation of the testis and tunica vaginalis. Certainly, however, common hydrocele is rather the result of relaxation of the arteries, in which their mouths pour out more fluid, than it is the effect of inflammation. The absorbent vessels of the spermatic cord are very much larger in hydrocele than on the opposite and undiseased side.

Hydrocele is not unfrequently the effect of inflammation of the testicle, which, as it subsides, leaves the tunica vaginalis filled with serum, of a deeper colour than usual, and often slightly tinged with red particles.

Hydrocele is generally merely a local disease; but is sometimes connected with a general hydropic disposition.

OF THE NATURAL CURE OF HYDROCELE.

If an hydrocele be suffered to remain and to become of large size; if the patient be under the necessity of labour to obtain subsistence, inflammation of the tunica vaginalis and scrotum will arise from excessive distention. A slough of the scrotum and tunica vaginalis is produced, and, as it separates, the water escapes: a suppurative inflammation succeeds, granulations arise, and the patient in this way receives his cure.

Case. — Hydrocele is not always cured by a blow which tears the tunica vaginalis. I once attended a gentleman, who consulted me for an hydrocele; and who, whilst riding in the neighbourhood of Gibraltar, was thrown forward upon the pommel of his saddle, and received a severe blow on the scrotum. The hydrocele disappeared, but in six months again formed, and was, he thought, as large as before. I injected it about two years from the accident.

OF THE CURE OF HYDROCELE BY ABSORPTION.

In children. — This disease is, in young people, very generally curable by absorption. If a child be brought to me with hydrocele, I direct a little calomel and rhubarb occasionally, and order a suspensory bandage, which is to be kept wet with the muriate of ammonia and liquor ammoniæ acetatis, in the proportion of ʒij. of the former to ʒvj of the latter. This, after a short time, produces excoriation, and leads to the absorption of the fluid. The tinctura lyttæ may be added, if the fluid does not absorb quickly.

When hydrocele is the result of inflammation of the testis, the same mode of treatment often succeeds in the adult, in promoting absorption of the fluid, viz, giving submurias hydrargyri c̄ extract; colocynth: comp: and applying an irritating lotion to the part. These applications have, however, no power over the common hydrocele of the adult, and I have tried continued blistering without benefit.

OF TAPPING FOR HYDROCELE.

When the general health forbids an operation, which, although mild, is attended in some constitutions with risk, if a patient's fears prevent him from submitting to a more effectual treatment, or when it is inconvenient to him to undergo any other operation; the water is removed by tapping.

Instruments. — The instruments required are a trocar and canula. The canula two inches long, and the eighth of an inch in diameter. A lancet only is sometimes employed; but it is an inconvenient instrument, leading to difficulty in evacuating the whole of the water, and to bleeding into the tunica vaginalis after the operation.

Mode of operating. — The mode of performing this operation is as follows: The person is to stand before the surgeon, who grasps the scrotum and swelling with his left hand, and introduces the trocar two-thirds of the length of the swelling downwards, and not directly horizontally, but with a slight obliquity upwards. When the canula has entered the tunica vaginalis, the trocar is withdrawn, and the canula is then passed further into the tunica vaginalis, and the water escapes.

The swelling is grasped, that the fore part of the scrotum and tunica vaginalis may be put upon the stretch, when the trocar enters easily.

The trocar should be directed slightly upwards, and then the testicle is not in danger of injury, which it will be if the trocar be entered horizontally; and the canula is further introduced when the trocar is withdrawn, by which a wound of the spermatic cord or testicle will be effectually prevented. When the water has been removed, and the canula is withdrawn, a small piece of adhesive plaster should be laid over the wound, and a suspensory bandage be applied.

Sometimes succeeds in curing. — This operation sometimes succeeds in preventing a return of the disease, although very rarely; but to give the patient the best prospect of it, a strong stimulating lotion may be immediately applied.

Exercise sometimes produces inflammation. I have known a person who had been tapped in the morning, get into a coach at night to go to Manchester, and have sufficient inflammation produced to effect a cure.

Time in which it forms again. — As in very few cases inflammation succeeds, or a cure is produced by this operation, the patient returns in a few months for its repetition; but the time of reaccumulation is very uncertain.

If the disease very soon reappear, it is a proof of an hydropic disposition, and it is right to give submurias hydrargyri, with squills, at night, and tincture of digitalis spiritus ætheris nitrici and mistura camphorata twice in the day.

Not devoid of danger. — This apparently trifling operation is not entirely unattended with danger, as the following case proves:

Case. — Mr Somersett, an aged gentleman, came to town from Wiltshire, to undergo this operation; and on the evening of the day in which it was performed, he took a long walk. On the following day

but one there was considerable inflammation in the scrotum, and his son, who was my dresser, advised him to rest and suspend the part. The inflammation, however, proceeded, and in a week he expired; gangrene having been produced in the scrotum to a considerable extent. Well may it be said in our profession, 'There are some you must not touch, there are others you cannot kill.' Mr Green, of Lewisham, has published a case of a similar kind, which I had an opportunity of witnessing.

LECTURE XVII.

OF THE OPERATIONS FOR THE CURE OF HYDROCELE.

Various have been the operations advised and resorted to for the cure of this disease: some very severe, others very uncertain in their issue. The excision of the tunica vaginalis to greater or less extent was practised by surgeons forty or fifty years ago: an operation which I have seen two or three times performed, but which I hope never to witness again; painful in its performance, and violent in its consequences, beyond what this disease (which is little more than an inconvenience) will warrant. A second operation consisted in passing a tent into an opening in the tunica vaginalis, which produced inflammation, but, from the adhesion being partial, it often did not prevent a return of the disease. Thirdly, caustic was used, potassa fusa was applied to the scrotum, and rubbed upon the part, until its influence reached the tunica vaginalis, destroying its life and texture; this, when well managed, was a very successful operation; but it required great attention in its use, and I have known it, in a diseased constitution, destroy life.

Different operations. — The operations to which I have occasionally recourse, are three; 1st, Injection; 2d, Seton; 3d, Incision. The object of the two former is, to excite adhesive inflammation, and to change the action of the part, so as to prevent further secretion; in the latter, to fill the cavity with granulations.

Injection. — For the operation by injection we are indebted to Sir James Earle; and those who are old enough to remember the contrariety of opinion on the treatment of hydrocele; how one surgeon advocated seton, another caustic, a third incision; well know how to appreciate the proposal of Sir James Earle, and must be aware how much our profession and mankind are indebted to him for his suggestion.

Instruments required. — The apparatus which is required for this operation is an elastic gum bottle, to contain about six ounces of fluid, fitted with a brass cylinder to receive a stop cock, which can be attached at pleasure. A trocar and a canula two inches long are also required.

Fluids injected. — The fluid which is used as an injection is, either equal parts of port wine and water, or sometimes, when a person has been very unirritable, and the operation has failed, two thirds of wine and one third of water, or 3j of zinci sulphas to lbj of water, or one sixth of spir: vini to five sixths of water. Cold water itself succeeds often very well, but I have known it fail.

Mode of operating. — The patient is placed in a recumbent posture upon a sofa or chairs, and the surgeon sits by his side; the tumour is lightly grasped by the left hand of the surgeon, and the trocar is thrust in gradually and obliquely. It should enter two thirds of the swelling downwards, and be directed not immediately downwards to the testicle, but a little upwards, so that if it penetrated it would pass more than one third of the swelling downwards. The trocar and canula having entered the tunica vaginalis, the trocar is withdrawn, and in doing this the surgeon not only nips the scrotum, but the tunica vaginalis around the canula, to confine it within the bag; and when the trocar is withdrawn,

he pushes the canula to its hilt within the tunic. The water then escapes into a basin provided for the purpose. The surgeon putting the stop cock into the elastic bottle, introduces the stop cock on the canula, and the contents of the bottle are then thrown into the tunica vaginalis; great care being taken to nip the tunic upon the canula; the bottle is then removed, the stop cock remaining upon the canula. The patient soon feels pain in his groin, next in the spinous process of the ilium, and then in the loins, sometimes the neck of the bladder suffers. The fluid is to be withdrawn at the end of five minutes, and then the operation is completed.

Time the injection is to be retained. — Although, as a general rule, five minutes are occupied in the retention of the injection, yet it may be observed, that the suffering is sometimes so considerable, that a surgeon might be tempted to believe that the fluid should be sooner removed; but the succeeding inflammation is not at all commensurate with the previous irritation: those who suffer the most at the time of injecting, have often the least inflammation, and I am, therefore, disposed to continue it the same in all adults. In the young, three minutes will suffice.

Tunic not to be distended by the injection. — I never distend the tunica vaginalis with the injection, but throw in less fluid than was removed from the hydrocele, and move it in the tunica vaginalis, so as to make it apply itself to every part of the surface. If much be injected, the cremaster contracts, and forces a part of it by the side of the canula into the cellular membrane of the scrotum.

Slight enlargement of the testicle. — If, when I have drawn off the water, I find the testis somewhat enlarged, it does not prevent my proceeding with the operation; for I find the excitement which it pro-

duces often diminishes the testis, and does not prevent the success of the operation.

After-treatment. —When the operation is concluded, much depends upon the after-treatment to render its issue successful. The suspensory bandage is not to be reapplied, and the rules laid down for the patient are these: If you are in much pain, lie down; if you suffer but little, take exercise; if you be in much pain, eat very little and drink only diluents; if you suffer but little, take your dinner and two or three glasses of wine; come to me to-morrow; if, then, there be redness in the scrotum, considerable tenderness, and some swelling, you direct the suspensory bandage to be worn, the exercise to be moderated, and the diet to be light; but if there be little appearance of inflammation, it is right to grasp the scrotum in one hand, and with the other to gently tap it a few times with the fingers to produce slight pain. Recommend exercise and a generous diet, until redness of the scrotum, swelling, and pain in the part be produced; for the inflammatory swelling from the injection should be nearly as great as that which had previously existed from the disease.

The swelling continues increasing for a week, is stationary for a few days, and then declines, so that in three weeks it has subsided; the operation rarely requires a confinement of more than a few hours; sometimes it does so for a week, but, in general, I say to my patients, after four days you will be walking about again; and then if they are not confined at all, they are much gratified.

Operation fails. —This operation sometimes fails in producing sufficient inflammation to effect a cure. I once asked Sir James Earle if he did not fail sometimes; and he said, scarcely ever; this is quite contrary to my experience; for I sometimes fail,

and should very often, but for great care in the after treatment, upon which, I think, much depends. I sometimes, when water is reproduced a few days after the operation, tap it to remove the serum, and to produce, by this operation, a larger share of inflammation.

From suppuration. — I have seen suppuration, after injection, in very irritable persons; and in cases in which the hydrocele has been the result of inflammation, and the inflammation of the tunica vaginalis had not completely subsided. It occasions delay, makes the operation much more painful, and renders confinement necessary, but it makes the cure more certain. A young man, about twenty years of age, came to me in Spring Gardens, with an hydrocele on each side. He resided in Long Lane in the Borough, a distance of two miles from my house. I injected one of the swellings with equal parts of port wine and water, and sent him home. I was sent for to him on account of a high degree of inflammation, which proceeded to suppuration, and which I imputed to suffering him to go to a distance directly after the operation. When he had recovered from this operation, I injected the other at his own house, and directed him to keep his bed, and used the same strength of injection as before, yet this hydrocele suppurated also.

Case. — I was once called in consultation a few miles into the country respecting a gentleman, whose hydrocele had been injected in London, and who was suffered to return home afterwards, and the tunica vaginalis suppurated.

When cysts grow between the tunica vaginalis and tunica albuginea, the operation will necessarily occasionally fail.

Danger of injecting. — The operation of injection is not entirely without danger, and the danger con-

sists in throwing the injection into the cellular membrane of the scrotum. I have seen many cases in which extensive sloughs were produced, and the following is a case well worthy attention.

Case. — A man had been under my care in Guy's Hospital for hydrocele, which I injected, and failed in producing a cure. The man, two years afterwards, was admitted under the care of one of my colleagues. I spoke to the man, and examined him; the case was decidedly hydrocele, in the same side as before. About a fortnight after, as I passed through the same ward, I said to one of the gentlemen by my side, 'Mr Godfrey, where is the man with hydrocele?'—'Sir,' said he, 'he has quitted the Hospital.'—'Indeed,' I said, 'why?' No answer was made. As I was returning over London Bridge, in my way to the city, Mr Godfrey joined me, and said, 'Sir, I beg your pardon for telling you the man had quitted the Hospital; but the fact is, that he is dead. The dresser of the surgeon under whose care he was, attempted to inject the hydrocele, by the permission of the surgeon: he threw in the fluid with great difficulty, and only after repeated efforts; the man complained violently, and when the injection was attempted to be withdrawn, it would not escape; in short, it had entered the cellular membrane only; violent inflammation and gangrene ensued, and the man died in a week.' This circumstance happened from the canula not being passed into the tunica vaginalis, so that the injection never entered it; and even if the canula has entered the tunic, and is not confined there by pinching the tunica vaginalis around it, it is apt to slip out. This was the reason why I mentioned the care which was necessary to push the canula home, and to pinch the tunica vaginalis round it.

Mode in which the cure is effected. — The mode in

which the cure is generally effected is, by the effusion of serum and fibrin into the tunica vaginalis; the serum becomes absorbed, and the fibrin glues the sides of the tunic together, and is also at length in a great degree absorbed; but this effusion is not necessary to the cure, which seems, in some cases, to be effected by a change of action in the vessels.

Case. — A captain in the coasting trade came to me with hydrocele, which I injected, and cured him. Some years afterwards I attended him with Mr Holt, surgeon, for a disease, of which he died. I requested of Mr Holt to take away the testicle and tunica vaginalis after death; which he did, and it is now in the collection of St Thomas's Hospital. The tunic had adhered very partially, it was more relaxed than usual, but did not contain water; so that from change of action, or effusion on the mouths of the vessels, it had ceased to be a secreting surface.

OF THE OPERATION BY INCISION.

When some obscurity hangs over the nature of the case as to its being connected with hernia, or some enlargement or disease in the testicle, it is sometimes, though rarely, necessary to open the tunica vaginalis.

Operation. — This is done by beginning an incision at the upper part of the swelling, and extending it two-thirds downwards; for if it be made to the lower part of the tunica vaginalis, it leaves the testis too much exposed, and produces excessive inflammation in it. The water being evacuated, and the state of the testis learnt, as well as if there be any disease connected with it (as cysts on the testis,) a little common flour is sprinkled in, and thus the surface is forced to granulate, and any return of the disease is sure to be prevented; very seldom, how-

ever, is such an operation required; and it ought not to be had recourse to but in cases of great doubt with respect to the disease, as it is one of great severity. After this operation a poultice only should be applied, and the cure is effected by suppuration and granulation.

OF THE SETON FOR THE CURE OF HYDROCELE.

In cases in which hydrocele will not yield to stimulating lotions, used with a view to produce absorption in very young persons, I prefer to the operation of injection the following plan:

I pass a common curved needle and thread through the hydrocele transversely, about half way from the upper to the lower part of the swelling, including about an inch and a half of integument, and one inch of tunica vaginalis. I then tie the thread with a knot, leaving it loosely hanging in the tunica vaginalis and scrotum. No confinement is necessary; the child runs about as usual, until the part reddens, swells, and becomes hard, which is about a week; and at the end of that time I withdraw the thread, and the adhesive inflammation produces the cure.

I sometimes, in the adult, adopt the same plan when the injection has not produced sufficient inflammation, and it prevents the necessity of any further operation.

HYDROCELE OF THE SPERMATIC CORD.

This disease is rather of rare occurrence. It may be defined to be an accumulation of fluid in the tunica vaginalis of the spermatic cord.

How formed. — The complaint is founded upon the following circumstance: When the testis descends

from the abdomen, the spermatic cord is closely invested by peritoneum, which adheres to its vessels; but the portion of peritoneum which descends with the testis from the lower part of the abdomen, does not, at first, adhere to the cord, but a channel, admitting of a probe, is left between the two portions; so that the tunica vaginalis is, at first, open to the abdomen from the testicle upwards. But after a time adhesion is produced of the tunica vaginalis from the place at which the spermatic cord quits the abdomen nearly to the testis, and the two portions appear as one. Sometimes, however, it happens, that in some part of the cord the adhesion is not complete, and then a space is left, in which a slight secretion proceeds, and which, accumulated or increased, produces at this part an hydrocele of the cord.

The swelling, when seated below the abdominal ring, is easily distinguished from others. It is globular, and when grasped and raised, it appears of a slight blue colour; it is very transparent; extremely firm to the feel; is unattended with pain; it rarely acquires any considerable size, and is merely an inconvenience to the patient from the impression it produces in his mind.

Difficult to distinguish from hernia.—When this swelling is seated in the spermatic cord above the abdominal ring, it is very difficult to distinguish it from hernia; for it disappears under pressure, is very apparent in the erect, and almost disappears in the recumbent posture; but there is no pain, no gurgling, no interruption to the bowels from the tumour. The disease in this situation feels like a bullet lodged in the cord,—left to itself it increases, and at last emerges at the ring, when its transparency decides its nature.

Treatment.—In the treatment of this disease it

may be injected, or an incision be made into it, or a seton introduced.

I am of opinion it is best not to inject them; for it is with difficulty done, and the disease is apt to return; this has happened to myself; and the following case, which had been under the care of a very intelligent surgeon, Mr Pulley, of Bedford, is a proof that it happened to another:

Case. — Master ——, of Bedford, had a hydrocele of the cord, of six years' duration: it appeared in part above, but the greater part just below the ring; it was very transparent. Mr Pulley tapped it, and it formed again immediately. Mr P. has twice injected it — once five years ago, and secondly, two years and a half since, but the disease returned. I cured it by making an incision, and introducing flour, but two abscesses formed during the cure.

A seton made by introducing a common curved needle carrying a single silk, is a more lenient cure.

A hydrocele sometimes, I believe, forms on the cord from a secretion, proceeding into a hernial sac shut at its orifice to the abdomen.

ON HÆMATOCELE.

Hæmatocele is a collection of blood in the tunica vaginalis testis. The tumour is pyriform like hydrocele, is not painful, does not affect the general health, and is attended with slight fluctuation, but it is not in the least transparent.

Distinguished from hydrocele. — It is distinguishable from hydrocele by its weight being greater, by its want of transparency, by its obscure fluctuation, but most easily by its being usually the sudden result of a blow upon the part.

Case. — A man came to my house in the country with a pyriform swelling of the scrotum, which, he said, had been the result of his being thrown in riding upon the pommel of the saddle, and that, at first, the scrotum had been also severely bruised, and was of various colours from extravasated blood. I made an incision into the tunica vaginalis, and discharged a large quantity of brown-coloured fluid blood, and large coagula changed in colour by long retention; I then ordered a poultice, to produce suppuration in the tunica vaginalis.

Case. — Mr W. was brought to my house by Mr Harris, surgeon, of Gracechurch Street, with a pyriform swelling of the scrotum, produced by a blow fifteen years before; and it increased progressively to the time at which I saw him. The testis and epididymis could be felt at the lower part of the swelling, and above it to the ring a solid substance, mixed with a fluid, could be perceived; the swelling was not in the least transparent, and he had never suffered pain in it. I opened the swelling at my house, Sept. 23, 1822, and discharged a greenish dark-coloured fluid blood, and solid substance of a slightly yellow colour. The tunica vaginalis was excessively thickened, looking like the densest parchment. He went home in a coach, which was about three miles; and on the same day, when imprudently sitting in his counting house, he was seized with a profuse hæmorrhage from the tunica vaginalis, and fainted: he was carried to bed, and he had violent constitutional irritation, with suppuration of the tunica vaginalis; but he did well.

Sometimes follows hydrocele. — Hæmatocele now and then follows tapping in hydrocele, more especially if a lancet be used. Mr Sherwood, of Reading, informed me, that a hydrocele being tapped, some blood escaped after the canula was withdrawn.

The lips of the wound were united, and some time after a fresh hydrocele appeared to be formed, and was to be operated upon by injection; but upon passing the trocar, the tunica vaginalis was found full of blood. An incision was made into the tunica vaginalis, the blood was discharged, and the patient was cured.

Case. — Mr Lewis, surgeon, in Mark Lane, had a patient whom he had twice tapped for hydrocele. About two months after the last operation, he returned with the appearance of a renewed disease, only that the swelling was somewhat rounder. Mr Lewis again tapped, and drew off a pint of thick bloody fluid. In a fortnight the swelling re-appeared, has never increased, but is gradually absorbing.

Case. — Hæmatocele is sometimes founded on hydrocele. A man was brought into Guy's Hospital, who had long had a hydrocele, who had received a severe blow upon it, which suddenly increased the swelling, bruised the scrotum, and produced great pain from distension. I made an incision into it, discharged a large quantity of water, and of coagulated blood, and found a rent in the tunica vaginalis about two inches long, covered with coagulated blood.

Case. — Dr Saunders, formerly teacher of medicine at Guy's Hospital, had a hydrocele, for which he applied occasionally to Mr Lucas, my colleague at Guy's, to have it tapped. In stepping upon a chair to reach a book, he fell against the back of the chair, and received a blow upon the scrotum, which led to the recurrence, as he thought, of his hydrocele, and in a few days he went to Mr Lucas to have it tapped, but upon the introduction of the trocar no water passed; the doctor then consulted several surgeons; and at length Mr Cline made an incision into the part, and the tunica vaginalis was

found full of coagulated blood, which was discharged, a poultice applied, and he soon recovered.

Not always produced by a blow. — Hæmatocele is not always produced by a blow. I attended, with Mr Hicks, in Bond Street, a gentleman, who had a large pyriform swelling in the left tunica vaginalis, which had never been painful, and which had an obscure fluctuation. I made an incision into the swelling, in the presence of Mr Hicks, and discharged near a pint of fluid blood. This swelling had not succeeded a blow, but Mr Hicks imputed it to excessive exertions this gentleman had been in the habit of making.

We have in the collection at St Thomas's Hospital a hæmatocele, in which the testicle was removed by mistake. The case assumed the symptoms and feel of a diseased testis, and the surgeon determined upon its removal. I took it to St Thomas's to dissect, for the surgeon who had removed it had not even the curiosity to examine the disease. When I opened the tunica vaginalis I found it most excessively thickened, and filled with coagulated blood of a brownish red colour. The testicle was placed at the posterior and lower part of the swelling.

LECTURE XVIII.

ON THE DISEASES OF THE TESTICLE.

That change to which the testicle is sometimes, but not very frequently subject, viz, the formation of a number of cysts or hydatids within its substance, is the disease which I shall first describe.

OF THE HYDATID OR ENCYSTED TESTIS.

Age at which it occurs. — This change in the testicle is usually observed in the earlier periods of life, generally from eighteen to thirty-five years, although I have seen it occur at forty-nine years. It has been said to begin in an enlargement at the end of the epididymis; but of the part in which it commences I am by no means certain, whether in the testis or in the epididymis; for the enlargement is so gradual and imperceptible, that it is usually discovered by accident. The disease is generally unattended with pain, nor does the patient complain of any tenderness in the part when it is handled. It does not seem to be produced by or attended with any constitutional disease, for the appearance of the person is sometimes that of robust health. There is no redness of the scrotum, but the veins of the spermatic cord are, in some instances, very much distended with blood, so as to be varicose. The form of the swelling is that of the testicle, rounded upon its fore part, and flattened upon its sides, rather than pyriform like hydrocele. The

epididymis, under the greatest enlargement, can be distinguished in its swelling from the testis by a line of separation between them. The disease is attended with obscure fluctuation, but it is rather a yielding at the part compressed with the finger, than an extensive fluctuation from one extremity of the swelling to the other. If the diseased part be firmly compressed, it gives the sensation of squeezing the testis; it gradually increases until it acquires great size, and then its weight becomes very inconvenient, and the disease produces considerable uneasiness in the loins, from the testicle stretching the nerve of the spermatic plexus. On these accounts, viz, the size it acquires, and the pain which its weight produces, the patient becomes anxious for its removal.

I have never seen this disease affect the spermatic cord to the abdomen, or extend its influence beyond the testicle and epididymis.

ON THE DISSECTION OF THIS DISEASE.

On cutting into the part after its removal, the tunica vaginalis is found to be a little thicker, and the tunica albuginea is much denser than natural. The testis is in its interior, is filled with numerous cysts of various sizes, some small as the heads of pins, others of the size of peas, and the largest about an inch in diameter: as they vary in size, so the fluid which they contain differs in appearance — the smallest contain a watery fluid, transparent, and without colour; the larger appear to be filled with serum; and the largest, when opened, discharge mucus with some pus, as they have undergone a partial suppuration. I have seen in these cysts a true hydatid contained in the fluid, like that which is frequently found in the liver. The cysts are highly vascular,

and their appearance is very beautiful when the serum is seen through a highly vascular cyst. The glandular structure of the testis seems to be in a great measure destroyed. The appearances in the epididymis are of a similar kind, only that the cysts do not acquire the same magnitude.

OF THE DIAGNOSIS OF THE HYDATID TESTIS.

Mistaken for hydrocele. — This disease is often mistaken for hydrocele; and it must be confessed, that they are with great difficulty distinguished from each other. I do not believe that there is any surgeon, who is candid, and who has had such opportunities as the surgeons of the large Hospitals possess of witnessing disease, who will not confess he has mistaken this disease in the testicle for hydrocele, and plunged a lancet into it, and has been surprised to find, that a little water and blood only have followed.

Marks of distinction. — The marks of distinction are a less extensive fluctuation, a much heavier swelling, rounded upon the fore part, and flattened upon the sides; the entire absence of transparency; the sensation of the testis being squeezed under pressure; the varicose state of the vessels of the cord and dilated veins of the scrotum; a division of the swelling into two, viz, testis and epididymis. Testis not felt as in hydrocele.

CASE I.

Charles Demby, aged forty-nine, was admitted into Guy's Hospital, 23rd of May, 1804, with enlargement of the testis. It began two years before in a diminution of the left testis, accompanied by a sense of weakness on the left side; it afterwards gradually became larger than the other; and he ap-

plied, three-quarters of a year after discovering this increase, to a surgeon of the first talent and respectability in the neighbourhood of London, who introduced a trocar into the testis, and a little water was observed to issue, but the quantity was very small. He immediately pronounced it a case of hydatid testicle: as it still continued to increase, the patient applied for admission into Guy's Hospital. On the 29th of May I removed the testis, and upon cutting into it I found a purulent fluid in some of the cysts, and the appearances which I have described in others. The wound quickly healed, and he was discharged on the 16th of June, having thus early entirely recovered.

CASE II.

Mr Davie, surgeon, brought me a testis from a subject in the dissecting-room, in which one of the globular hydatids was lodged. It was enclosed in a distinct cyst, produced by adhesive inflammation; the hydatid itself exactly resembled that which is so frequently met with in cysts of the liver.

CASE III.

Bartholomew Lupre, aged thirty, an Italian sailor, was admitted into Guy's Hospital in April, 1809, with an enlarged testis, which he reported began four or five months previously; the cause was unknown, but he supposed that it arose from a cold, produced by his wearing wet clothes; the veins of the scrotum were much loaded with blood, and those of the spermatic cord were very varicose. This man suffered considerable pain in his loins from the weight of the swelling. I performed the opera-

tion of removing the testicle, and found it, upon dissection, full of cysts of various magnitude.

CASE IV.

A young medical man called upon me with enlargement of the testis, unattended with pain: its increase was gradual, its weight was considerable, its fluctuation obscure; the general health was good. Mr Guthrie removed the testis, which I examined, and found to be of the hydatid or encysted kind: he gradually recovered.

Cause.—The cause of this disease is unknown, and I shall not indulge in speculation, which would probably be unsatisfactory for want of proof, and useless in preventing the occurrence of the disease, if clearly developed.

The operation for the hydatid disease is required from the inconvenience resulting from its size, and from the pain in the loins produced by its weight. A quantity of blood should be taken from the arm; the patient briskly purged for a few days, and animal food refused for a week before the operation. I have never known a patient do otherwise than well under the removal of the testicle for this disease.

No danger of return, if removed.—You may confidently also assure your patient, that there is no remote danger of returning disease; for in no instance has there, within my knowledge, been any extension of the complaint to the abdomen by the absorbent vessels.

It is right to state, however, that I once saw in Mr Moorhouse, a medical gentleman who died of a fungous testicle, which extended into the abdomen; in some parts of the testicle numerous hydatid cysts mixed with the morbid fungus or medullary struc-

ture; so it seems that the two diseases may be combined in the same individual.

OF THE MALIGNANT DISEASES OF THE TESTIS.

The testicle is subject to two diseases of a malignant character: viz, the fungus and the schirrus disease: of which the former is by far the most frequent.

OF THE FUNGUS, MEDULLARY, OR PULPY DISEASE OF THE TESTIS.

Under these various names has this disease been described — fungus, because when it ulcerates, a large fungus projection forms from it; medullary, because it has somewhat the appearance of the brain in a putrid state; pulpy, because it is soft, and easily breaks down to pressure. It has been often also called the soft cancer, on account of some resemblance it bears to cancerous affections, although its texture is of a much softer consistence.

Symptoms. — The symptoms of this complaint are as follow: It begins in an enlargement in the body of the testicle, which is, at first, accompanied with great hardness, and the form of the swelling is more globular than that of the testis in its natural state. The epididymis becomes soon affected after the disease has shown itself in the testis; the enlargement proceeds generally rapidly, although, in some cases, it varies in that respect. The pain which attends it, is at first only occasional, and not severe. Slight causes, as a catarrh, or more than usual exertion, increase its size; but by rest, the enlargement subsides nearly to its former state: it soon becomes of the size of a small orange and of its globular shape: it feels very hard, but is free from tenderness when

pressed; it at length forms adhesions to the surrounding parts, so that the scrotum, after a time, is only moveable over it at some points. It is, at first, regular on its surface; after a time the cord enlarges above the abdominal ring, and at length it contracts adhesions to the pubis. At first the scrotum is not inflamed, although the vessels are somewhat larger. A gland or glands become enlarged in the groin, unattended with pain after the testis has adhered to the scrotum, and which gradually increase. An absorbent gland also generally enlarges on the opposite side to that in which the disease begins. The disease extends by absorption into the abdomen, before the testis adheres to the tunica vaginalis and scrotum, and produces a cord which may be traced upon the psoas muscle by deep pressure to the region of the kidney, where it produces, just below the emulgent artery, a tumour, readily felt by pressure, when the abdominal muscles are relaxed by bending the body in the recumbent posture.

Constitutional affection. — At first the constitution does not suffer, although the countenance of these persons is generally sallow at the very dawn of the disease, showing that the general health is in some degree defective. There is, sometimes, uneasiness in the loins, and sharp pricking pains in the thighs and legs; and as the disease advances, the leg, thigh, and foot, on the diseased side, become œdematous, and feel weak. For some time before death the patient loses his appetite, and gets but little sleep: he has profuse perspiration; the bowels are generally very irregular, as the tumour on the abdomen increases, though prior to that time they are regular, and there is sometimes an irritability of the bladder, and frequent inclination to make water. The iliac glands are also enlarged above Poupart's ligament.

Period in which it proves destructive. — I have

known the disease very rapid in its progress, terminating the patient's existence in a few months; but I have also known it two years in one case, five years in another, and fourteen in a third. The fact is, that a simple chronic disease in the testicle will remain stationary for a length of time, if the constitution be tolerably good; but if it become deranged, a malignant action is produced, and the disease assumes the character of the complaint I am describing.* The testis in this disease has often a disposition to ulcerate; the scrotum adheres to the

* This is well illustrated by the following case: James Verrall, æt. 26, employed as a musician at one of the theatres, in the spring of 1823, contracted a gonorrhœa, for the fourth time, which, in three or four weeks, gave rise to an inflammation and enlargement of the testicle; for this he applied evaporating lotions, and kept at rest, and by these means reduced the inflammatory symptoms; but the testicle still remained hard and much larger than in the natural state. He then returned to his usual mode of living, which was very irregular, and in the following October the testicle became farther enlarged, particularly at the posterior part, and it continued gradually to increase in size, until his admission into St Thomas's Hospital, on April the 8th, 1824. The following is an account of the symptoms and appearances at that time. His countenance sallow, secretions irregular, and much general constitutional derangement, with occasional severe pain in the affected part, extending to the loins. The testicle was about the size of a large orange, somewhat uneven on its surface, feeling extremely hard in some parts, and in others soft and fluctuating. The usual remedies for chronic diseases were employed without producing any alteration in the disease, when, by the advice of my colleagues and myself, he consented to have it excised. This I did for him in the usual way: and on examining the diseased testicle, after its removal, I found the substance of the gland converted into a soft, pulpy, or medullary matter, in the centre of which was a small abscess; the epididymis presented a hard mass, like scirrhus, and had numerous portions of cartilage deposited in it, and at its upper part was a bunch of hydatids.

After the operation, he had a severe attack of peritonitis, which was subdued by active treatment, and he left the Hospital much improved in health, with the wound quite closed.

tunica vaginalis, and assumes a livid hue. A sense of fluctuation is produced, so that it might be supposed to contain a fluid; ulceration begins in the scrotum, and through the opening a fungous substance projects, which discharges a very large quantity of a watery fluid; bleedings occasionally ensue from this fungus. If the testicle be pressed, a quantity of matter which looks like putrid brain issues; the fungus sloughs, then the part discharges profusely, bleeds, and again sloughs, until the patient is exhausted by irritation and discharge. Towards the close of life the pain is often excessively severe in the part, in the abdomen it is occasional only; and the patient has vomiting, and frequent attacks of diarrhœa. I have known a person just before death have the following symptoms, vomiting, hiccough, violent pain in the abdomen, swelling of the legs and thighs, tumour in the abdomen, and pain with tenderness on pressure over the abdominal muscles.

DISSECTION.

The testicle in these cases varies in its appearance according to the stage of the disease. A secretion of a soft pulpy matter, looking something like brain, is found deposited in the midst of the semeniferous tubes in its early stages; and as the disease advances, and the testicle becomes enlarged, the semeniferous tubes are absorbed, and the peculiar secretion of this disease occupies their natural situation. I have injected several of these diseases, and we have beautiful specimens of them in the collection. The secreted solid substance is very partially vascular; in some parts the vessels are very numerous, in others they do not enter the disease; those which do, are so tender in their coats, that they readily give way to very slight force; when ulcer-

ated the fungus is found very vascular, other parts of the tumour appear broken down, so as to have lost their organization, and resemble cream; portions of the substance are solid like brain, but in separate masses; some have often also a woolly or floculent appearance.

The true nature of the disease. — The true history of the disease appears to consist in the part secreting, not common fibrous or adhesive matter, but a material of much softer consistence scarcely supporting vessels in some parts, whilst in others there is a rapid growth of the blood vessels: in one case, therefore, it falls readily into disorganization; in another, produces a projecting fungus so soon as ulceration allows the vessels a less limited growth; but more of this hereafter. In some parts we find coagulated blood mixed with the matter effused, and in others small collections of serum.

Disease in the spermatic cord. — In the dissection of the body the spermatic cord is tuberculated with fungous tumours, which contain a soft white pulpy mass; and similar swellings adhere to the peritoneum within the abdomen. A tumour is found on the loins, reaching from thence upwards, behind the intestines, to the kidney. It covers the aorta and vena cava, and the kidney adheres to it: when cut into, there issues from the tumour a considerable quantity of matter which looks like thick cream, mixed with a small quantity of the colouring parts of the blood. The mesenteric glands are enlarged; the liver has tubercles in it; the thoracic duct is sometimes obstructed by a fungus or medullary secretion on it; the duodenum passes over, adheres to the tumour, and is narrowed by it, and the aorta and cava also adhere to it posteriorly. The coats of the aorta and vena cava become diseased.

OF THE DIAGNOSIS OF THIS DISEASE.

Difference from hydrocele. — This is a difficult task. From hydrocele, the want of transparency; the more globular form of the swelling; the pain which occasionally attends it; its yielding, rather than extensively fluctuating, and the appearance of want of general health, become the means of distinguishing it.

From hydatid testicle. — But from the hydatid testicle, when this disease arrives at the pulpy state, the distinction is much more difficult, and the most experienced are liable to err. Pain in the part occurring at distant intervals; a sallow complexion, and the appearance of deficient general health are the criteria, but still I have known the best surgeons mistaken. I really am decidedly of opinion, that in hydrocele, hydatid, or fungus testis, no objection exists to introducing a lancet to discover the real nature of the disease. If it be hydrocele, the rush of water directly proves its nature. If it be the hydatid swelling, a little water, mucus, and blood escape; and if medullary, blood only; sometimes a little brain-like substance appears upon the lancet, which immediately informs the surgeon of the true form of the complaint. It does no mischief in the cases which it cannot relieve, and without it the surgeon's reputation is endangered, if he gives a rash opinion upon the nature of the disease.

OF THE CAUSE OF THIS DISEASE.

Deranged state of constitution. — This disease arises from a defective state of the constitution: it generally occurs in persons naturally feeble, and in those who are irritable, both in body and mind.

They are subject to slight feverish attacks, to irregular secretions, to defective digestion; the former producing new and disordered actions; the latter leading to an unhealthy state of blood in which the quantity of serum is large, and the fibrous part of the blood small in quantity, and loose in texture. But independent of the state of constitution, there is also an altered local action: if the parts inflamed from this disease are cut into, a fungous structure will be produced from the wound: but if the contaminated parts are entirely removed, the wound heals as any other wound in the body without any such morbid appearance.

OF THE TREATMENT OF THIS DISEASE.

Medicines of no service. — No medicine has been yet discovered which has any influence over this disease, when it has been once formed. The common remedies used for the preservation of the general health may, by improving the constitution, lessen or prevent the tendency to the disease; but no medicine has any influence upon it when the local disease has once appeared. The pil: hydr: submuriatis composita given at night, and infus: cascarillæ, soda, rhubarb, and ammonia, given bis die, or hyd. c. creta, soda, and rhubarb, are the best medicines to improve the constitution; yet we ought to look further, to try to discover, amidst the numerous new articles which chemistry and the extension of botanical knowledge have given, if some specific remedy cannot be discovered for this disease. The local remedies hitherto employed have been equally inefficacious. Leeches and evaporating lotions, upon general principles, retard the progress of the disease, but nothing has any specific power in changing the action of the part; when ulcerated, solu-

tions of alum, of sulphate of zinc and of copper, and diluted nitric and sulphuric acid are of some use. All, then, that is left to the surgeon is to improve the constitution first, next to effect the removal of the disease by the knife; and when this has been done, to give such medicines, and rules of living, as shall, by improving and preserving the health, change the constitution, and lessen the disposition to the return of this disease.

Operation uncertain. — The removal of this disease by operation is very often unsuccessful, as the disease is very apt to return in the part, or in some distant organ of the body, if a constitutional treatment is not previously and even afterwards pursued. I removed in a patient of Mr Sterry, in Bermondsey, a fungous ulcer from the shoulder, and the disease soon afterwards showed itself in the eye, of which the patient died. I removed, in a Mr Bernard, an eye affected with this disease, and in less than twelve months the disease reappeared in a very large swelling above the groin. In the removal of this disease in the testicle, the complaint frequently returns in the loins and in the spermatic cord. It is quite necessary that the operation should be performed in an early state of the disease. If, therefore, a patient applies with this disease, and I put him under a course of mercury, and treat him as I shall directly describe I do a simple chronic inflammation of the testicle, and if it do not yield, I advise its removal; for if the spermatic cord in the least participates in the disease, the operation does not succeed: so soon as the wound be healed, and sooner if the wound be slow to heal, I give constitutional remedies to improve the general health, and to lessen the disposition to a return of the disease.

OF THE TRUE SCIRRHUS OF THE TESTICLE.

A very rare disease. — This is an extremely rare disease; that which I have previously described being the most frequent; — indeed, for a length of time I doubted if the testicle was subject to the disease to which the breast is so prone; viz, the scirrhus, which, in its progress, produces cancer.

I have seen few examples of that hard swelling in the testis which resembles scirrhus, and I have never seen but one instance in which that hardened testis ulcerated and destroyed the part, resembling in its progress the cancerous ulcer of the breast. Old persons are most liable to this disease; in the few examples in which I thought the disease might be scirrhus, the age has been between fifty and seventy years.

Symptoms. — The symptoms have been, a slow increase of the testicle, a hardness which rendered the part almost impenetrable to pressure, occasional severe pain in the part extending towards the loins, the disease beginning in the testis; at length extending to the epididymis; extremely slow in its progress; the surface of the testicle feeling tuberculated, irregular, knotted, and excessively hard; the spermatic cord becoming gradually thickened; the body bent forward, or the thigh advanced; the leg and thigh, upon the affected side, swollen and œdematous; some water effused into the tunica vaginalis, so that the testis is felt through an hydrocele, a tumour at last forms in the loins, but never acquires the magnitude of that in the medullary disease, nor does the testis become so large in scirrhus as in the complaint before described. The patient sinks from impaired digestion, violent pain in the abdomen, and irregular state of bowels.

DISSECTION.

When the testicle is cut open, the tunica vaginalis and tunica albuginea are thickened; and, instead of the tubes which form the secreting structure of the testicle, a hard white mass is found, in lobes or tubercles, which are harder than the other parts, and in which cartilaginous and sometimes ossific matter are deposited. The epididymis has the same appearance, and some tubercles are found in the cord.

SCIRRHOUS TESTIS.

Case. — Thomas Cheston, aged 44, who had resided at Tottenham, was admitted into Guy's Hospital, for an enlarged and hardened testis. The testis, when first enlarged, was impenetrably hard; water formed around it, and the hardened mass was felt through the surrounding water, which, being drawn off, was found to amount to four ounces. His disease began in June 1808, and he says, he first observed a pain in the loins, and, a month afterwards, hardness and uneasiness in the testicle: it gradually increased, but never became very large. The testicle and epididymis, when he came to the Hospital, were both affected, but the spermatic cord was not enlarged. He had much pain in his loins, more especially in stooping. His countenance became then sallow; his digestion impaired; his leg and thigh (but first the latter) became enlarged and œdematous. He had been a strong muscular man, and thought he was in good health when the disease began. The testis was removed in March 1809, and the wound slowly healed. He was discharged the Hospital as soon as the wound was closed; but the swelling in the thigh and leg remained, and he died a month after his return to Tottenham.

On examination of the testicle, after its removal, it was found hard, white, very compact, tuberculated, and in a few spots very vascular. The epididymis was also enlarged. We have, in the collection of St Thomas's Hospital, three or four preparations of this disease, in which the appearances of the testis are as above described. The substance is white, very hard, tuberculated, cartilaginous matter in one part; some ossific matter in others.

The disease does not increase, either in the part or in the abdomen, to the same magnitude as the fungous disease.

Disease of the cord. — This disease requires the operation for its removal: but if the cord be affected, I have not known the operation succeed; and, indeed, there is some danger to life in its performance.

Case. — In visiting the wards of Guy's Hospital, I saw a man who had a testicle very hard and considerably enlarged, and the cord of at least three times its natural size. I said to the students, 'It will be of no use to operate in this case, for the disease has extended beyond the reach of the knife.' One of the students, who thought himself wiser than the rest of the world, told the man, if he would place himself under his care, he would take a lodging for him, and remove the part. The man consented, and this young man removed the testicle, tracing the cord, as I was informed, very much towards the abdomen. Peritoneal inflammation succeeded, and the man died in a few days, prematurely for the patient, usefully probably for the rest of life to this foolish and presumptuous student.

Constitutional treatment. — This disease will require the same constitutional treatment as that which I before described, after the operation has been performed, to prevent the return of the complaint.

LECTURE XIX.

OF THE SIMPLE CHRONIC ENLARGEMENT OF THE TESTIS.

This is an extremely frequent disease, and one which has been mistaken for a malignant complaint of the part.

Commencement of the disease. — This disease begins in hardness and swelling of the epididymis, at first unattended with pain. It gradually increases, without pain, until the testicle becomes involved in the disease; the testis is quite smooth; the epididymis may be traced separately from the testis, the line of separation being more distinct than in the natural state. The patient's health appears generally but little affected, and the part is so indolent, that the patient handles it with a degree of roughness, which surprises the surgeon. Both testicles not unfrequently become affected at the same time; and sometimes, when the enlargement is subdued in the one, the other becomes diseased in a similar manner. The surface of the testicles and epididymis remain quite smooth, even under great increase of the part.

Its further progress. — In the state which I have described the testicle remains for weeks, and sometimes for months; and then under severe catarrh or violent exercise, especially on horseback, it becomes very painful, with uneasiness of the loins and redness of the scrotum, which will be relieved by the means which are to be hereafter described; but soon the symptoms return, and at length a suppurative inflammation ensues, which usually happens at the extremity of the epididymis: a sinus follows,

which discharges seminal fluid, stiffening the linen as semen is wont to do. From this sinus granulations spring and produce an exuberant growth, forming a prominent granular swelling upon the scrotum. This still continues for an indefinite time, unless something be done by surgery for its relief.

DISSECTION.

Before this disease was understood, I have several times known the testicle removed for it, and the appearances upon dissection I have preserved in the collection.

Adhesive stage. — In the adhesive stage, an uniform yellowish white adhesive matter loads the tissue of the part; the semeniferous tubes remain, but are separated by the effusion which I have described.

Suppurative stage. — In the suppurative stage, upon cutting into the epididymis, and sometimes into the body of the testicle itself, a small abscess is found, containing pus, mixed with adhesive or fibrous matter; and this state of the testicle will sometimes render its removal necessary. When it forms a granular swelling, it is found, upon dissection, that a small opening is formed in the covering of the epididymis, through which the granulations spring and expand; and sometimes the testicle itself forms the granulation from the abscess which it contains, and which passes through an opening in the tunica albuginea. These abscesses will sometimes, after discharging for months and even for years, absorb the testicle, and leave the patient with little more than the tunica vaginalis and the tunica albuginea remaining; and if both testes have been affected, impotence is the result.

OF THE CAUSE OF THE SIMPLE CHRONIC DISEASE.

Morbid state of the urethra. — This complaint is often depending for its production upon a morbid state of the urethra, which produces a sympathetic influence upon the testicle. Sometimes it is simple irritation only of the urethra which produces it; sometimes a stricture in the membranous part; now and then an irritation in the prostate gland, or in the prostatic part of the urethra. But still it is wrong to view it as having merely a local origin; for there is, in most of these cases, a state of constitution which predisposes it, and without constitutional alterative means you will not succeed in curing it. I have often seen this disease follow syphilis; frequently observed it accompanied with an eruption, which many would conceive of a syphilitic character; often known it to follow a mercurial course in delicate persons, who have, during the time, been exposed to vicissitudes of temperature, and to catching cold from being frequently wet in inclement weather.

OF THE TREATMENT OF THIS CHRONIC INFLAMMATION.

This complaint, for which the testicle is frequently removed, under a mistaken idea of its malignant tendency, generally yields to the treatment which I shall now advise you to adopt.

When you are consulted respecting the complaint in its adhesive stage, you will say to your patient, 'Now, if you choose to be cured, there is no difficulty in effecting it; but I fear you will not submit.' —'Oh,' he says, 'I will submit to any thing to prevent the loss of my testicle.' Well, the plan then is as follows:

Position.—1st. Observe the recumbent posture for a month. It is not sitting with your legs raised which will suffice, but to be absolutely recumbent is necessary.

Medicine.—2d. Take two or three grains of submurias hydrargyri and a grain of opium night and morning, until the mouth be sore; and then such a quantity as shall preserve that tenderness of the gums for a month.

Local bleeding.—3d. Apply leeches twice in the week, or let the patient stand before his surgeon and have the veins of the scrotum opened by a lancet.

Applications.—4th. Apply upon the scrotum equal parts of camphorated mixture and vinegar.

5th. About every fourth morning give an active dose of infusion of senna, with sulphate of magnesia and tincture of senna.

Period required for the cure.—In about three weeks, in this way, you will reduce the size of the part; and then, if the urethra has been diseased and the complaint be sympathetic, you may introduce daily a silver sound, to remove any obstruction in the urethra, whilst the patient is still recumbent and living low; when the disease will, at the end of the month, or of five weeks, be cured.

In the practice which I have had an opportunity of witnessing, it will be readily supposed I have seen a great number of such cases, and I can therefore speak with confidence of the result of the above treatment; but the following is an excellent example.

Case.—An officer of the British army, of considerable rank, some years ago, was seized with inflammation in his testicle, for which he applied to a surgeon; who, after various attempts to reduce it, told him that it was a malignant disease, and that it must

be removed. He submitted to the operation and quickly recovered. Some months afterwards the remaining testicle began to swell, and the symptoms were so exactly similar to those of the former disease, that he became excessively alarmed, and placed himself under the care of Mr Rose, who requested a consultation with Sir Everard Home and myself. We found the testicle hard, swollen, and but little painful: his general health had suffered from a warm climate and exertions disproportioned to his strength. He was put upon the plan which I have recommended above, and in a very few weeks was perfectly well.

A fair inference may therefore be drawn, that the testicle which had been removed might have been saved.

Many testicles condemned for removal I have thus known preserved.

Sometimes requires removal.—When the disease has proceeded so far as to produce an abscess in the testicle, it will sometimes require to be removed.

Case.—One of our students, who afterwards became a surgeon in the cavalry, had an inflammation and chronic enlargement of the testicle, which had been repeatedly relieved by means similar to those which I have recommended; yet each time he returned to exertion, the inflammation and swelling were reproduced: tired by repeated disappointments, and unable to pursue his profession as he wished, he begged me to remove the part, which I did: and upon examination of it, after the operation, I found a chronic abscess in its centre.

Granular swelling.—When the abscess is followed by a large swelling, produced by an exuberant growth of granulations (a granular swelling,) the treatment which is to be pursued is to be as follows:

Treatment. —1st. Try pressure with adhesive plasters; and if this does not succeed,

Caustic. — 2dly. Sprinkle the surface with powdered sulphate of copper, or nitrate of silver, which gradually reduces it. I once knew arsenic applied freely upon the granulations, and it destroyed life.

Removal. — 3dly. It may be removed by excision. An elliptical incision is made into the skin on each side of the projecting granulations, and then the knife is to be carried horizontally under the root of the swelling, where it projects from the opening in the tunica albuginea; and thus it is removed. The edges of the skin are then brought together by suture, and healed.

4thly. But when the epididymis and testicle are much involved in the disease, and there is much loss of substance in the scrotum, it is necessary to remove the testicle.

OF THE IRRITABLE TESTIS.

Symptoms. — This disease is known by the following symptoms: — the patient has an uneasy sensation in a part of the testicle: it is tender to pressure, tender also in exercise, and unusually sensitive at all times. The sensibility of the part becomes occasionally so much increased, that the slightest touch is exquisitely painful; pain is felt in the back and groin; the motion of the part and slight pressure of the clothes in walking produce so much pain as to almost forbid exercise, and the patient finds no comfort but by reposing continually upon a sofa, or by remaining in bed. The testicle is little swollen, and the whole of the part is not equally tender. The spermatic cord sometimes partakes of this exquisite sensibility. If the part be not supported, the pain is scarcely tolerable. The patient is obliged to

place himself in bed upon the opposite side to the disease, or he does not rest. He has pain in the thigh on the same side, — the testis appears full and loaded. Motion in most cases produces not only pain at the time, but additional uneasiness afterwards. The stomach is rendered extremely irritable, and vomiting is sometimes produced.

The disease frequently continues many weeks, sometimes exists for months, and with others endures for years. When the patient thinks himself much better, a little more exercise than usual renews all the symptoms.

The complaint produces, in some instances, so much distress of mind, so high a degree of bodily suffering, and so completely incapacitates the sufferer from amusement, and the pursuit of a profession or business, that he seeks relief from an operation which I was thrice compelled by the patients to perform, rather than recommended it upon my own judgment.

The following is a statement by a medical man of the symptoms of the disease, which rendered his life burthensome to him.

CASE I.

'I think I can trace back the origin of my complaint to the spring of 1817, about eight or nine months before I married. I lived too well: got very corpulent and bloated, and had excessive venereal excitement, which I did not gratify, and felt the testicles and vessels of the cord ready to burst; but when I rose and walked, the uneasy sensations subsided.

'Soon after I married I began to feel the uneasiness in the testicle I have since suffered from. I felt pain in coitu so great, as to lead me to go to

London for advice. The testis is a little fuller; extremely tender to the slightest touch of the fingers: coitus always irritates it, so that the swelling and tenderness increase from it: the soreness is felt in the upper and outer part of the testis, and in the vessels of the cord. With regard to the nature of the disease, I have been a long time convinced it is seated in the nerves of the spermatic cord; the pain is a benumbed sensation, — at some times, a pricking feel; — at others, such as would proceed from a compressed or irritated nerve. It is uniformly increased by whatever disturbs the position of the testis, or presses upon the ring, or course of the cord. I can bear the erect position for a few minutes, provided the part be properly adjusted. When I lie on the left side, the pain is of a dragging kind, and feels as if it extended from the region of the cœcum; and when on the right it is more sharp, and feels as if the parts, which are tender, were pressed upon by those in the neighbourhood: I feel most easy on my back. There is considerable fulness on the side of the pubes, which is always increased, and extends higher in the direction of the cord, when the pain in the testis has been greater than usual.

'After aperient medicine has produced two or three motions, I usually suffer more pain for a day, and the passage of flatus through the cœcum produces the same effect.

'The cord appears, as far as its tender state will bear examination, to be free from organic change; and the testis, excepting that it is occasionally full, seems unchanged in size or structure.

'My general health is good, and every other function is natural: — yet I have now been confined to a horizontal posture for a year.

'It has always happened, that however severe

the pain has been on the side and right limb, or region, it has given way to cold applied to the abdominal ring; and comparative if not perfect ease has been enjoyed for an hour afterwards.

'The means which I before used, but most ineffectually, as to my cure, have been leeches; a solution of nitre, in a bladder, to the part; belladonna and the cold hip bath; sea bathing; regular aperient medicines, and all the means which the best advice in this country could suggest.

'I consider my symptoms might have originated in an injury I received upon the cord, some time before the symptoms began.'

CASE II.

Master H. aged 14, has a teazing and aching pain in the testis. Exertion brings on the pain; leaning forward increases it. He cannot walk one hundred yards but he has pain in the groins, loins, thigh, and leg, to the foot, on that side; the testicle is tender to the touch. The recumbent posture relieves him, unless he has catarrh, and then he has the pain even in bed.

DISSECTION.

I have removed the morbid part in three instances; and I thought, in the first case, the centre of the epididymis was diminished, and that the disease might be produced by an accumulation of semen behind it, and that the obstruction might produce the pain; but I am inclined to believe that the disease is in the nerve, as in the other two cases there was no marked disorganization.

It seems to me to be a species of tic douloureux, supported by the constant functional changes to

which the part is liable; for if it arose from organic change, it would not, as it does, cease for a considerable time, and then relapse.

OF THE TREATMENT OF THIS DISEASE.

Medicines. — The remedies I have seen most useful have been small doses of the oxymurias hydrargyri with the compound decoction of sarsaparilla, given twice per diem, and continued for a length of time. The application of a belladonna plaster to the part, and opening a blister at the groin, and dressing it with ung: cetacei et opii. A sea voyage to a warm climate, I have known improve the patient, from the rest and change of constitution it has produced. It will be right to try arsenic, which has considerable power over tic doloureux; to give Quinine, as bark relieves it; also to try steel, as it has been recommended by Mr Hutchinson, of Southall, but at the same time to deplete the part by leeches, and lessen the nervous irritation by the application of a solution of nitrate of potash and muriate of ammonia, in a bladder. Bougies do not relieve it; but the ung: lyttæ, used to produce a slight discharge from the beginning of the urethra, I have known of service.

The following are the three cases in which I have operated for the removal of the testis on account of this affection.

CASE I.

Mr G—— contracted a gonorrhœa at Paris, in October 1815, and in consequence had inflammation of the right testicle, for which he applied fomentations and took aperient medicines: the testicle continued swelled and painful until June 1816, when the

employment of strengthening plasters removed all inconvenience; a slight degree of pain returned at intervals until June 1817, when he was again relieved by plasters, and thought himself sufficiently well to join his regiment. The exercise, which his duty obliged him to take, soon occasioned so much pain, that during the winter of 1817 and spring of 1818, he scarcely had a moment's respite, but only used a blister, which he thought increased the tenderness. In May 1818 he returned to England, and bathed in the sea till September, at which time the pain was nearly removed, but he was unable to walk or ride. Since he has not employed any remedy but nine weeks' sea-bathing at Brighton, which produced no amelioration: he was unable to walk ten yards without experiencing considerable pain; the only thing which appeared to relieve him was violent motion in a rough carriage.

On account of the continued pain, confinement, consequent depression of spirits, and loss of health, he determined on having the testicle extracted, which I removed on the 1st of March 1819. The wound healed slowly, and one or two small abscesses formed in the scrotum, but he ultimately did extremely well.

CASE II.

Captain P. had an irritable state of the left testis, which commenced in March 1818. The vein of the spermatic cord felt distended; the part was exquisitely tender to the touch, and exercise produced pain, which was intolerable if the part was not supported: he could not rest on the left side, or bear the slightest pressure on the testis; he had increased pain in coitu, and after it the part felt full and loaded. He was somewhat, but only for a time, re-

lieved by the hot bath, or fomentations. He tried blistering at five different times: applied two hundred leeches, at separate times, to the affected part: employed also various lotions, opium, and belladonna, with every medicine which seemed likely to be useful in lessening the irritability; but all without benefit.

I removed the testicle for him in 1823: he quickly recovered from the operation, and felt very grateful for his restoration to society.

CASE III.

This case is drawn up by the gentleman himself, who came from America to consult me; he also saw Mr Abernethy and Mr Pearson. Having tried every variety of medicine and local treatment without advantage, and determined not to return to America with the disease, at his request I removed the part, and have since heard that he remains perfectly well. He says:

'For several years past my left testicle has been larger than my right; at times considerably so, especially when I have taken cold. Early last summer I began to be uneasy about it, but neglected to take advice. In August I lost two children by the yellow fever, and in my anxiety I exposed myself to unusual fatigue; and in a few days after their death, the last week in August, I had for the first time pain in the left thigh and groin, also in the testicle, which was much enlarged. I then applied to one of our best surgeons, who made an incision into it, and let out a large quantity of water; this was about the 10th of September: he then desired me to suspend it, as I do now, and to use a lotion of the extract of lead and opium. In a few days after the part again became painful, for which I applied tepid

poultices of bread and milk, and bathed it in warm water. The pain continued, and in about six weeks after, the operation was repeated; but very little water was drawn off: no injection was used. For some time previous, and for about six weeks after the second incision, I took mercurial pills, two or three each day, and occasionally used mercurial friction on the thigh and testicle, keeping up a soreness in the mouth, but not producing much salivation. With some intermissions this course was continued for about four months: I laid in a horizontal position, except occasionally for a few minutes at a time, and drank only toast and water; lately I have taken Madeira and water, or one or two glasses of Madeira, at dinner. In December, a blister was applied to the scrotum, which produced a copious discharge. I think all these remedies gradually reduced the size of the testicle; but the pain continued; sometimes a sharp shooting pain in the groin; but generally a heavy, dull, constant pain.

'In March I procured some leeches from New-York, and applied seven; bathing with tepid water, by which I got away a considerable quantity of blood, producing great debility. In April I again applied three leeches; since which I used the lotion of lead and opium.

'At present the part is about the same size as it has been for two months past; but the pain is constant, and I cannot stand for ten minutes without increasing it considerably: there is great sensibility in the part; the slightest touch is painful.

'My general health is as good as it has been for years past; I am subject to headach, and other dyspeptic symptoms: a long residence in warm climates has injured my constitution.'

OPERATION OF CASTRATION.

I shall conclude this Lecture with describing to you the operation of castration. The patient being placed upon his back, upon a table of convenient height, with his legs hanging over its end; and the hair of the pubis being removed, the surgeon begins his incision at the upper part of the external abdominal ring and extends it to the bottom of the scrotum. The lower part of the scrotum should be divided, or a bag of matter afterwards forms in it. The next incision is made upon the spermatic cord, just below the abdominal ring, so as to lay it distinctly bare, and to enable the surgeon to raise it. In this second incision the external pudendal artery is divided, and affords a bleeding, which leads the surgeon to request it may be compressed by an assistant, until the testis be removed. The next step of the operation consists in raising the spermatic cord, and in passing a curved needle, armed with a ligature, nearly through its centre, just below the abdominal ring; the ligature is then to be held by an assistant, which prevents the retraction of the cord into the ring, by the contraction of the cremaster muscle. The cord is then completely divided, and the surgeon drawing by it the testicle towards him, separates the cellular tissue between it and the scrotum, and thus detaches it from the surrounding parts.

Sometimes, from inflammation, the testicle adheres to the scrotum, in which case it is best to remove a portion of the latter, rather than to make a tedious and painful dissection in separating these parts. When the testicle is removed, the spermatic artery is sought for in the anterior part of the cord, and, when found, is to be secured by a ligature; next, an artery which accompanies the vas deferens,

is in like manner to be tied, taking care to exclude the vas deferens from the ligature; after this, the thread which had been passed through the cord, to prevent its retraction, is withdrawn. Any vessels in the scrotum which bleed must be taken up. The coagulated blood is then removed from the scrotum, and two sutures are put into it to bring the edges of the wound together; one just over the end of the cord, and the other midway between it and the bottom of the incision; lint is to be laid over the wound, and it is best at first not to apply any plaster.* The part is to be supported by a handkerchief, or T bandage.

The ligatures separate in about eight days, and in three weeks the wound will probably be healed. The cruel practice of tying the whole cord with a broad ligature is now properly abandoned by every good surgeon.

* From the loose texture of the scrotum, and from the large quantity of cellular tissue, the small vessels are liable to escape the notice of the surgeon immediately after the operation, by their retracting. I always allow the patient to become warm in bed before the dressing is completed, at which period the scrotum becomes relaxed, and I have seen a free hæmorrhage occur at this time, obliging the surgeon to remove the dressing, in order to secure the bleeding vessels. If no further bleeding, however, takes place when the patient has become warm, the wound is dressed with some mild plaster, and the parts well supported. — T.

LECTURE XX.

ON DISEASES OF THE BREAST.

The diseases of this organ have been too much considered as being of a malignant nature; and females, who have had the misfortune to have tumours in their bosoms, have been often very unnecessarily submitted to an operation, under the idea of the complaint being cancerous. I shall therefore proceed to state what I have been able to learn of the various diseases of this organ, to discriminate the malignant from the more benign complaints, and to point the cases which really require removal, in distinction from those in which operations are entirely unnecessary.

OF THE HYDATID OR ENCYSTED TUMOUR.

Symptoms. — This disease begins in a swelling, which is unattended with pain, and which has the character rather of a chronic inflammation, in a part of the breast, than as bearing a resemblance to a scirrhous tubercle; for it has neither its mobility, its excessive hardness, nor its general circumscribed or distinct limits, but it incorporates itself with the surrounding parts of the breast.

The skin over the mammary gland is undiscoloured, and the part is scarcely tender to pressure. The general health is unaltered, even when the swelling becomes of the most formidable magnitude.

Becomes in part fluid. — As it increases, a change in the nature of the swelling is produced: at first it

was uniformly solid, but is afterwards distinctly divided into a solid and a fluid part; the latter fluctuating, so as at once to inform the surgeon of the existence of a fluid. If this part be punctured, a liquid, having the usual character of serum, is discharged; the cyst sinks, but soon becomes again distended, and the swelling continues to grow. At length the tumour acquires enormous magnitude, and some of the largest swellings in this organ are of the hydatid kind. I have twice seen swellings not of this description, rather larger than the hydatid; but generally the largest in the breast are of this kind.

One, which I removed, with Mr Cline, from Lady Hewett, weighed nine pounds.

From Mrs King, at Charing Cross, I removed one which weighed thirteen pounds; but frequently they are removed when still small, under a supposition that they are scirrhous tubercles.

These swellings are pendulous, and the whole breast is very moveable even when large; they are generally unattended with pain, although to this rule there are exceptions, and the constitution is but little disordered. The absorbent glands, in the most aggravated form of this complaint, are undiseased, so that it does not extend by absorption.

Inflammation of the cysts. — Inflammation sometimes takes place in one of the cysts; and, when the cyst ulcerates, serum mixed with mucus, and occasionally with a little matter, is discharged; the wound then heals, and the cavity seems obliterated; but the disease again ulcerates in other parts, and passes through the same process.

It is a complaint I have seen at all ages after twenty, but more frequently in advanced age than in youth.

DISSECTION.

Upon dissection, the breast is found to be consolidated by the adhesive inflammation, so as to form a very firm swelling in some parts, but in others it contains cysts distended with serum. The cysts vary in size; some of them contain mucus mixed with pus. The cysts which I have seen in the breasts have been of three kinds. First, The globular hydatid, like that which is found in the liver, contained within a vascular cyst. A second species, composed of numerous membranes, which may be peeled from each other, like the concentric lamellæ of the crystalline humour. But tumours of the breast are sometimes composed of simple bags, which contain and secrete the serum, or watery fluid, within them.

CASE I.

Mrs King, of Charing Cross, aged 58, had an enormous enlargement of her left breast; she discovered it fourteen years ago, and supposed it arose from a blow. When first observed it was as large as a marble only, hard, and entirely unattended with pain

It seemed to be buried in the breast, and was not very moveable in the glandular structure.

It gradually grew until two years ago, when it had acquired the size of a melon. At that period it seemed suddenly to grow faster than before; but was still unattended with pain, and her general health appeared to be good.

Last Christmas it also acquired a very sudden increase, but was still free from any painful sensations, excepting that sometimes, when she had a cold, she felt a slight uneasiness in the part.

On the 30th of September 1822, I was consulted; the tumour then measured thirty-five inches in circumference, was solid, and felt cartilaginous in some parts; but in others was soft and fluctuating, and one bag evidently contained a large quantity of fluid. The solid tumour was placed above, the fluid occupied the lower part of the swelling. Her general health was good, and the swelling was free from pain; but she suffered much from its weight drawing down the skin and pectoral muscle, and putting the nerves exceedingly on the stretch.

On the following day it was removed, in the presence of Mr Key, surgeon of Guy's Hospital, and Mr Laviss, a practitioner in Westminster.

The large vessels, divided in the operation, were immediately secured, or pressed upon, so as to prevent any considerable loss of blood.

The wound when dressed on the seventh day appeared healthy; her constitution suffered but little, and she recovered without any untoward circumstance, and is now living at the same residence.

Upon inspection, the greater part of the swelling appeared like boiled udder; within which, at various parts, cysts were contained, and when these were opened, hydatids, composed of numerous lamellæ, were found: serum was effused around them.

CASE II.

June 1818. — Lady Hewett, aged 60, tall and of strong constitution, dates the origin of the swelling in her breast from a blow she received, November 1815, in her axilla, by falling against a chair; although she had previously felt some evanescent pains in her right bosom. Nine weeks after the blow she felt uneasiness in the right breast, which extended into the axilla. In the beginning of 1816

she discovered a swelling in her right breast, which was about the size of a nutmeg, situated below the nipple. In May 1816 it had acquired the size of a melon, and she consulted Dr Sharp, of Thrapston, who ordered her what medicines he thought most appropriate to her situation, and sent her to Harrowgate; but, as the swelling increased, she applied leeches every day for two months, and afterwards every other day, till September, without advantage.

She then determined to try the influence of pressure, which she continued several months, by adhesive plaster, and afterwards by an instrument, contrived for the purpose, which was worn during four months, but without any advantage, as the swelling still continued to increase.

She therefore determined to leave the case to nature, and she did so until November 1817, when the swelling began to undergo a change. It increased quickly, and became soft at its upper part, appearing inclined to suppurate: — fomentations and poultices were applied, calomel and opium given, but matter did not form. This treatment was continued until the May following, when she discontinued all the means.

In June 1818 she made up her mind to submit to an operation, which I performed on the 10th day of June 1818, in the presence of Mr Cline, Mr Lowdell, and my nephew, Mr Bransby Cooper.

The swelling was of great size, weighing nine pounds. It was in part solid, in some parts evidently contained a fluid, and over the fluid part there was a slight blue tint. The swelling was very moveable, and reached down upon the upper part of the abdomen. Lady H.'s general health was good. The first steps of the operation consisted in making a puncture into the tumour at its most prominent part, and discharging a quantity of serum

from it, by which it was at once clear the disease was of the hydatid kind, and the magnitude of the swelling was lessened. An incision was then made across the tumour, a little above its middle, and the flap of integument being raised, the upper part of the swelling was detached from the pectoral muscle; and with the handle of the knife the swelling was further separated, and a flap of skin being left below to meet that at the upper part, the operation was thus concluded. The removal was borne with great fortitude. Two arteries, of considerable size, required to be secured. The integuments were brought together by a single suture, and by adhesive plaster. On the 16th of June the wound was first dressed, and on the 30th Lady H. was quite well.

CASE III.

The wife of Dr W. aged 45, twenty-six years ago, fell in getting into a carriage, and received a blow upon the breast, which immediately became black and uneasy; she applied leeches upon it, but a small lump remained. Three years ago the swelling began to increase, and, from a rounded form, became oblong, but was free from pain; its increase was so gradual, that little alteration was produced in twelve months. At this time the veins began to enlarge and the skin to be discoloured; yet still it was free from pain. At the end of two years she applied to me, and I ordered leeches, which emptied the veins, but did not diminish the swelling, for it continued to increase, and several blue spots appeared upon it; but it preserved a globular form: spirituous lotions were applied upon it to check its growth by evaporation.

Two months before the operation the tumour

underwent a sudden increase, and was supposed to weigh about five lbs. She was free from pain during the whole progress of the disease; her spirits were good; her activity undiminished, and her constitution was unaffected until the last two months, when she said she felt nervous; and head-aches, which she had always had occasionally, increased in the progress of the disease: the original lump was for a time distinct in the tumour, but at length blended itself with the general mass.

In June 1818, in the presence of Mr Cline, I removed this tumour, by making two flaps, as in the last operation, and I tied the arteries which I divided as I proceeded. Little constitutional irritation followed, and in six weeks Mrs W. was well. The appearances in this breast were similar to those in Lady Hewett's.

CASE IV.

Mrs Styles, aged 28, had a tumour in the breast which had existed three years, and which was sometimes painful from changes of temperature, and sometimes from the approach of menstruation; but the pain was inconsiderable.

It began in a swelling of the size of a filbert, which was hard and moveable; but it gradually became larger until it was about two inches in diameter: her menstruation and bowels were regular, but rather inclined to costiveness; her general health was good.

My nephew, Mr Bransby Cooper, removed this swelling, before me; and when he cut into the tumour, a bladder of water was opened.

The cyst, in which the water was contained, appeared very vascular; it was then removed: the wound healed in a fortnight; but an abscess after-

wards formed and discharged for six weeks, and then closed. This was therefore a simple cyst, formed in the cellular membrane, containing a considerable quantity of a serous secretion.

We have, in the collection at St Thomas's Hospital, a large globular hydatid, which Mr Cline informed me was discharged from the breast.

It appears then, as I have stated, that there are three kinds of hydatid or encysted tumours, in the breast. One, in which the production is a globular hydatid, like that which is considered to be a distinct animal, and which is now and then met with in different parts of the human body; the second a cyst composed of numerous lamellæ like the chrystalline humour; and the other, a bag containing serum, and probably produced by an adhesive process shutting the communication between the cells of the cellular tissue, in which secretion proceeds.

DIAGNOSIS.

The marks of distinction in this disease are: 1st, the health remaining perfect; 2dly, the almost entire absence of pain, unless there is a suppurative tendency in the cysts, when I have known the disease painful; 3dly, the swelling being firm, smooth, and not tender to the touch; 4thly, when a fluid forms, the fluctuation being very distinct, and a slight blue tinge being observable when it approaches the skin; 5thly, the fluid, when evacuated, having the transparency of water, with a very slight yellow tinge, and this is sometimes succeeded by a discharge of mucus.

TREATMENT OF THIS DISEASE.

When the tumour becomes of great magnitude,

there is no other mode of relief but by removing it; and, although the complaint be very formidable in point of size, yet the operation is attended with very little danger, and if the arteries have become large, the only care which is required is to secure them them during the operation, as they are divided.

When removed by operation, it does not return. — No remote danger exists, for I have never known this disease return after any operation in which the swelling was clearly removed; although I have (but not in the breast) when a small part of the swelling remained. But the disease does not contaminate the absorbent vessels or their glands, but is to be considered as entirely local.

When a single cyst exists, the swelling does not require removal.

Case. — A young woman was sent into Guy's Hospital, many years ago, by Mr Saumarez and Mr Dixon, who had a tumour in her breast, which at first felt hard, and was about two and a half inches in diameter. Seeing her general health was perfectly good, I applied a plaster, and did no more; the swelling underwent but little change, and she quitted the Hospital. Many months after she applied again for admission, because the swelling was much increased, and I then ordered her into the operating theatre, to remove it; but upon examining it with great attention I felt a fluctuation, and turning to the students, I said, 'I shall put a lancet into this swelling to ascertain its contents;' which I immediately did, and serum only was discharged. I introduced a small piece of lint into the orifice, brought on an adhesive inflammation, the sides of the cyst adhered, and the patient did well, having no return of the complaint.

ON THE SCIRRHOUS TUBERCLE.

This disease is of extremely frequent occurrence.

The symptoms with which it is accompanied are as follow:

Symptoms. — The swelling is generally discovered after it has acquired considerable magnitude, and it must have been the growth of several weeks. It is said to be discovered by accident: but if the patient distinctly traces her feelings she will have observed some uneasy sensation, which led her to feel the part. Sometimes the attention is first attracted to the bosom by a drop of bloody serum having stained the linen opposite the nipple, it having flowed from one of the lactiferous tubes. Sometimes a distinct and sharp pricking pain leads to the discovery of the swelling.

Situation. — It feels extremely hard. It is evidently seated in the gland of the breast. It is moveable, but more so with the breast than in itself. It is usually distinctly circumscribed, so that the surgeon thinks he is able to decide upon its limits, yet it generally happens that portions of it branch out into the gland and connect it with parts of the breast at a distance.

Sometimes not tubercular. — In some instances it is rather a scirrhous inflammation in the breast than a distinct tumour, which hardens and swells the bosom throughout its whole extent. In this state I have seen it cross through the cellular tissue to the other breast, and gradually extend in a similar manner through it. At first the scirrhous tubercle is not painful, but subsequently becomes so; but then the pain is occasional only, occurring at distant intervals.

Pain acute. — The pain is excessively severe, commonly as a stab in the part; sometimes a burning

heat; now a pricking sensation; then a sense of tearing, as if the nerves of the breast were torn out, or the breast itself tearing off. In other cases the pain is more obscure, like the aching of rheumatism. It generally extends to the shoulder on the same side, and often affects the nerves of the arm.

Intermittent pains. — The painful sensations in the breast recur about once in ten days or a fortnight, when the swelling begins to be painful; but more frequently, as the disease advances; and I believe there is an occasional determination of blood to the part, and that the disease increases, particularly when this painful period recurs.

More severe prior to menstruation. — Prior to menstruation, (about four days,) the breast feels fuller, heavier, and much more painful; and although, from the last-mentioned period it may have been tranquil, it scarcely ever fails to have painful sensations at the return of the menstruation; but more just prior to it, than at the exact moment; for it is relieved so soon as the evacuation begins, and is always much lessened after its cessation.

Gradual increase of the disease. — The swelling gradually grows from the size of a marble, when it is first observed, until it acquires a magnitude of two or three inches in diameter; for it rarely happens that the true schirrhous tubercle increases to a very considerable bulk, and this circumstance is one of its criteria.

Retraction of the nipple. — The next change is a retraction of the nipple, and this occurs from the lactiferous tubes being drawn out of their course by the swelling, and consequently they draw in the nipple, in which they terminate; frequently also the nipple becomes red, inflamed, excoriated, and sometimes ulcerated.

Puckering of the skin. — A change is also produced

in the appearance of the skin, it is puckered so as to resemble a cicatrix, and this arises from its adhesion to the surface of the tubercle. Frequently the follicles of the skin are filled with black sebaceous matter around the nipple, in the areola, and in the skin on the surface of the breast.

Absorbents become affected. — The cellular membrane becomes inflamed and hardened, and little tubercles form in the absorbent vessels under the integuments.

The glands in the axilla enlarge. — At this period, or sometimes prior to it, the glands in the axilla become enlarged, and many of these are often affected. But if the disease be on the sternal side of the nipple, the gland just above the clavicle at the lower part of the neck, is felt hardened and increased; for then the irritation is extended by the absorbents through the intercostal muscles to the internal mammary absorbent vessels and glands.

Extends to the clavicular glands. — When the glands in the axilla have been many of them enlarged and obstructed, I have seen the schirrhous irritation proceed by the absorbents from the axilla to the back of the shoulder, on the scapula, and extend from thence to the glands above and behind the clavicle.

Exists for years without destroying life. — Months and sometimes years roll on, and the disease continues in its adhesive stage, and it even often destroys without further change occurring; but frequently it proceeds to a suppurative inflammation: then the skin appears of a lived redness; the pain becomes even more severe; a slight sense of fluctuation, or rather of yielding, is perceived in this part, which gradually ulcerates and discharges only a bloody serum; for true pus is not generated. Pus is attempted to be produced; but it is not formed

upon the truly malignant surfaces, but only upon the surrounding parts, if they be ulcerated. I have, however, sometimes seen an approach to suppuration.

Character of the sore. — The surface of the sore feels hard, like the original tumour, and is remarkably insensible to pressure; and you therefore will observe the patient wipe it and handle it with a degree of roughness and want of gentleness, which surprises those who are unaware of its little sensibility. The granulations which spring from the sore are imperfectly formed; in some parts rising considerably, in others scarcely any are produced: they differ from common healthy granulations in their hardness, in their insensibility, and in their secretion; which is, as I have stated, generally a bloody-coloured serum.

The ulcer frequently bleeds. — Bleedings from the sore are frequent; they occur spontaneously, and relieve the patient's sufferings; and the observation of this may have led to the use of leeches in the treatment of the first stages of the disease: they also arise from removing the adhering dressings, or from wiping the surface of the sore; and the flow of blood does not easily stop, as the vessels have little power of contraction; pressure, however, succeeds in checking the hæmorrhage.

The edges of the sore become everted, the ulceration gradually proceeds until a large ulcer is formed, and often a very deep excavation is produced, so as to expose and even ulcerate the pectoral muscle. At this period, and often before ulceration has commenced, the patient complains of rheumatic feelings in different parts of the body, but particularly in the loins and in the thighs; but I have also known other parts, as the spine, become painful: violent pain and tenderness have been felt in the sternum and ribs,

and the patient describes the pain to be that of animals gnawing the parts. I attended Lady M. who, for many weeks before her death, described herself to suffer daily the pains of the rack, arising from cancerous rheumatism.

The appearances produced by this disease in the bones, I shall presently describe.

Great dyspnœa is also attendant upon this complaint, and the patient cannot lie down in bed, or can only rest upon the diseased side; she is also frequently teazed with a cough, unattended by expectoration.

Frequently violent spasms are felt, which are referred to the region of the stomach, and they are often attended with vomiting; but, I believe, they arise from a tuberculated state of the liver. The complexion is sallow, with now and then a slight flush upon the cheek.

Extension of the disease. — After some time the arm, upon the diseased side, begins to swell above the elbow, then the fore arm enlarges; at length the swelling extends to the axilla. Its feel is brawny; it does not pit so easily as common œdema; the swelling seems to arise from the loss of absorption produced by the destruction of the texture of the absorbent glands, and from compression upon the veins of the axilla, from glandular enlargement. The constitution becomes excessively irritated by the swelling, by the pain which attends it, and by the augmented disease in the breast, and thus gradually the patient sinks under her sufferings.

OF THE DISSECTION OF PERSONS DYING WITH SCIRRHOUS TUBERCLE, OR CANCER.

The tumour in the breast is a solid mass, approaching to the firmness of cartilage, waved upon

its surface, composed of fibrous matter within, and the lactiferous tubes may be seen in white lines, taking their course through it.* If macerated for a time in the same water, the scirrhous matter softens and leaves the cellular texture, in which it has been deposited, with its fibres thickened and unnaturally strong. Processes extend from the swelling into the surrounding parts of the breast, which must be carefully felt for in the living subject, if an operation be performed. The blood-vessels at the edge of the tumour are more numerous than in its substance, unless it be ulcerated, and then around the ulcerated part a great many are seen.

It seldom happens, when a tumour of this kind exists in the breast, that only one is found, for there are generally several smaller in different parts of the glandular structure. The skin often adheres to the surface of the swelling, and the absorbent vessels of the skin have frequently little tubercles in their coats.

If the swelling adheres to the pectoral muscle, scirrhous matter is deposited in the direction of its fibres, and it is converted into a hard and white substance; the glands in the axilla are changed in their internal appearance from the deposit of a scirrhous secretion resembling that in the breast, but more vascular and more quickly ulcerating, and then they become spongy. The glands above the clavicle are in the same state; and those on the left side, when enlarged, press upon the end of the thoracic duct, and disturb its functions, producing excessive pain for some time after taking food.

The glands behind the cartilage of the ribs, when

* It sometimes happens, that earthy matter is secreted into the lactiferous tubes within the swelling; but this is by no means a constant appearance.

the disease is placed upon the sternal side of the nipple, are generally diseased. It often happens that the axillary glands upon the opposite side to the diseased breast are also enlarged and hardened.

Of the lungs. — When the chest is opened, the lung on the diseased side, and sometimes on both sides, is inflamed, and partially adheres to the pleura costalis. Serum is found in the cavity of the pleura, on the diseased side, from which I have known death produced in a few days, after an operation of removing a scirrhous tubercle. When the finger is passed over the internal surface of the pleura costalis, little scirrhous tubercles are felt upon it, and the pleura on the surface of the lungs has similar, but larger, scirrhous swellings.

Of the liver. — The liver has frequently scirrhous tubercles on it, more especially when the disease in the breast is seated on the right side.

Of the uterus. — The uterus is rarely free from disease; one, or sometimes several scirrhous tubercles are formed in it, and this produces the pain in the loins, of which the patient so frequently complains.

Of the ovaria. — I have also seen the ovaria enlarged, hardened, and tuberculated.

Of the bones. — The bones have frequently scirrhous deposits on the cancellated structure.

We have the sternum, taken from Mrs Edge, preserved in the collection at St Thomas's, with scirrhous secretion in it. We have the thigh bone of the same lady, which broke merely in her rising from bed. We have a fractured thigh bone in the collection, taken from another patient, which broke by her turning in bed.

We have also two most curious specimens of diseased spine, in which much of the bone has become absorbed, and scirrhous tubercles deposited in the spaces left by absorption.

Age at which this disease appears. — With respect to the age at which the disease appears, I have frequently seen it at all periods between thirty and seventy years. I do not recollect more than two cases, in which the nature of the tumour was decidedly scirrhous, under thirty years. I have seen one case at ninety-three years, another case at eighty-six, and have removed one at seventy-three, ulcerated, and the patient did well. It most frequently occurs about fifty years of age. I ninety-seven cases, which I remarked, twelve were of that age.

Often confounded with chronic disease. — The tumours which are found in women under thirty years of age, and which are usually called scirrhous, are really only simple chronic enlargements, and are not disposed to malignant action, and do not absolutely require removal.

Does not always shorten life. — When the disease occurs in very old persons, it does not in general shorten life; but the patient lives as long with it as probably she would have done if such tumour had not existed, and dies of some other disease. I saw a lady at eighty-six, who consulted me upon the propriety of an operation for this disease, and whom I advised not to submit to it; and, after several years, she died of another complaint.

Occurring at the cessation of menstruation. — The disease is supposed to occur more particularly at the cessation of menstruation, and which is really the fact, for it is frequently sympathetic with the uterus; but still the exceptions to this rule are very frequent. The symptoms are augmented by the approach of menstruation, and decline as the period is passing. The disease occurs more frequently in unmarried women than in others, and in women who, being married, have had no children, probably because the breast has not undergone that change

for which nature had designed it, in being the fountain of nourishment to offspring; but yet pregnancy and nursing do not prevent the tendency to disease in some persons; for I have known a woman die of the complaint who had been pregnant seventeen times, and had ten living children.

If a tumour exists in the breast previous to the cessation of menstruation, a malignant action will occur in it at the period of its cessation, or soon after it.

Many persons in a family affected. — There are sometimes several persons in the same family who will be affected with this disease. A physician had three relatives, sisters, the first of whom had a scirrhous tubercle of the breast, of which she died. A second had the disease, which was removed by Mr Lucas, sen.; the disease returned, and she died. The third has applied to me, from a very painful swelling in the breast: they were unmarried. Therefore, in a family in which one is affected, the first dawn of complaint should be carefully watched, and the general health be well attended to in others.

Progress of the disease slow. — The progress of this disease to its termination is always slow; but in some more so than in others; and it is well that patients, who must fall victims to the disease, should know that it often remains stationary, and that I have seen it in one instance seventeen years; one twenty-two years; in the last case the thigh bone was broken by a very slight accident; and, after several months, appeared to be united, and then again became broken, in an effort to remove her from bed. As I was examining the thigh bone, I observed her breast ulcerated, and asked her how long the disease had existed, and she said twenty-two years. The breast on the left side was absorbed, and a scirrhous swelling, with some enlargement, existed over a large portion of the skin, covering

the pectoral muscle. Dr Babington informed me, that he knew a lady, who had symptoms of the disease twenty-four years.

Cause of scirrhus. — The cause of this disease is supposed to be some accidental blow, or the pressure of a part of the dress; but although a blow may produce a swelling on the bosom, yet that swelling will not be of a scirrhous nature, unless some defective state of the constitution disposes to malignant action. If the constitution be good, the effects of a blow are speedily dissipated; but if the constitution be faulty, the swelling grows into a formidable disease. The complaint is, in part, constitutional, in part local. It is constitutional in so far as the disposition to malignant action is produced by the state of the habit. It is local also, because the action in the part is peculiar, and the result is a specific effusion different to that of common inflammation. A wound, therefore, made into the parts will produce, on scirrhous disease, a cancerous ulcer; but a wound made in removing the swelling heals like one in any other part of the body. So with respect to the constitution, unless it be changed by a medical treatment, the disease will return as the disposition to malignant action which continues will reproduce it.

Influence of the mind in predisposing to scirrhus. — Anxiety of mind, tending to the presence of slow fever, and suppressed secretions, are the predisposing causes of the complaint. A mother watching with anxiety a near and dear relative in sickness; deprived of her natural rest, and inattentive to the deviation from health in her own person, is often afterwards affected with this disease. A person, the prey of disappointment from reduced circumstances, and struggling against poverty, when her prospects begin to brighten, finds a malignant tumour in her

breast; costive state of bowels, a dry skin, a paucity of other secretions have attended this anxious state of mind, and laid the foundation of that destruction which awaits her.

DISSECTION.

In the examination of persons who have died from this disease, besides the affection of the neighbouring glands, scirrhous tubercles are found in many other parts of the body, but more particularly in the thoracic and abdominal viscera.

CASE I.

In addition to the scirrhous deposit in the sternum of Mrs Edge (already mentioned,) scirrhous tubercles were found in the following situations:

In the integument covering each breast; in the glandular structure of the breast itself, and in the neighbouring absorbent glands; also in the substance of the pectoral and intercostal muscles.

Thorax — On the pleura of each side, and on the pericardium, the cavities of which contained water; also in the substance of each lung.

Abdomen — In the liver, pancreas, mesenteric glands, and uterus.

CASE II.

In the dissection of another patient, who died with an ulcerated cancer on the right breast, scirrhous tubercles had formed in the direction of the internal mammary artery on each side, but more particularly on the right; also in the intercostal muscles. The surface of each pleura, and the substance of each lung, exhibited numerous similar tu-

mours. The bronchial glands were also enlarged from the same cause.

There seem to be three species of scirrhous inflammation.

Three species of scirrhus. — First, That producing a tubercle, which gradually grows to the size I have described.

Secondly, That which gives origin to a number of small scirrhous tubercles in several parts of the breast, affecting both breasts, and producing similar tubercles in various parts of the cellular membrane, in the lungs, and in the liver.

Thirdly, A scirrhous inflammation of the breast, which seems to involve the whole of the glandular structure, hardens the whole breast, which becomes attached firmly to the pectoral muscle, and to the skin, and often extends over to the opposite bosom.

LECTURE XXI.

OF THE TREATMENT OF SCIRRHOUS TUBERCLE.

No specific remedy having been yet discovered for this disease, all that the surgeon can do is, to employ the constitutional treatment best calculated to keep the disease in check, by lessening inflammatory action.

Constitutional remedies. — The same attention is required to the due support of the secretions, as in other complaints of an inflammatory kind; and the pill: hyd: subm: comp: in the quantity of from three to five grains at night, with compound infusion of gentian, soda, and rhubarb, form an excellent medicine in that point of view.

Steel has been recommended; but although it is useful in another form of disease of the breast, in this it often occasions a feverish heat; therefore it should not be employed unless in cases in which the uterine secretion is defective, and then the Plummer's pill at night, and the following draught twice per diem may be beneficial:

℞. Vini ferri ℥j.
Ammoniæ carbonat: gr. vij.
Aq: menth: virid: ℥j.
Tinct: card: comp: ℥ss.
M. ft. Haustus bis die sumendus.

Opiates. — Medicine must also be given to relieve the severity of suffering, and to subdue the agonizing pains with which the disease is often accompanied. The tincture of opium, the liquor opii seda-

tivus, the black drop, are given in succession, as either form is losing its effect, combined with the camphor mixture, and a little of the spiritus ætheris comp. which is the best mode of administering them. A patient of mine in Guy's Hospital was much relieved by the stramonium, and this medicine may be given in the following form:

℞. Ext: stramonii gr. ½.
Camph: gr. 2.
M. ft. pilula bis terve die sumenda.

Very small doses of belladonna sometimes succeed in diminishing the pain, and I have known bark also mitigate the severity of the symptoms.

As no specific has yet been discovered for this disease (for it would be infamous quackery to say, that any such remedy is known for it) medical men, instead of going over again and again trials of the same means, should endeavour to discover, amidst the numerous new articles of medicine with which chemistry has of late years furnished them, some remedy for this complaint.

When there is cough attended with dyspnœa and pain in the side, a small quantity of blood, viz, six or eight ounces, should be taken from the arm, and then the blood is usually covered with an inflammatory coat.

Effects of climate. — Climate has been supposed to be likely to influence the progress of this disease; but so far as I have been able to learn, it has no favourable effect. A lady consulted me, with a scirrhous tumour in her breast, which was removed: soon afterwards her husband's mercantile affairs obliged him to go to the Island of Trinidad, and the wife accompanied him. She suffered greatly from sea-sickness in her voyage, and it might have been expected that this would have produced some

change of action in the constitution. From the extreme warmth of the climate, some favourable change might have been expected to have arisen; yet, in a few months, the disease returned in the breast; and, finding that it was making considerable progress, she determined to return to England. I saw her soon after her return; but the change from a warm to a cold climate had produced no more favourable change than her visit to the warm temperature of Trinidad. The glands in the axilla were enlarged; the breast was ulcerated; her lungs had become affected; her body was emaciated; and it was evident she had but a short time to live. I also lately knew an English lady visit the south of Europe, when labouring under this disease, and there she died of it.

Vegetable diet. — It is supposed that a vegetable diet, and food affording little nourishment is conducive to recovery. There is no greater mistake. Whatever weakens leads to an increase of the disease, and to a more rapid termination of the existence. Low living renders the person irritable, quickens the pulse, and makes the constitution feel the disease more strongly. Vegetable diet has not the least beneficial influence over this complaint. Wine and fermented liquors, given so as to produce a quicker pulse, or heat of skin, are equally improper, as a feverish state is equally pernicious with the nervous irritability which low living produces. In short, diet has no specific influence, and that which has agreed best with the patient at other times is the most appropriate under this disease. Meat once per diem, and weak wine and water, as a drink at dinner, agrees best. The other meals, morning and evening, to be as usual.

Local treatment. — The local treatment of the complaint consists in subduing inflammatory action;

by perspiration; by wearing oiled silk; soap cerate, or a poultice of bread and poppy water; wearing a piece of fur upon the part, or a portion of hareskin, is found to tranquillize the disease.

Leeches. — As the pain is occasionally severe, and the disease seems to grow by occasional determinations of blood, it is right at these times to apply leeches; four or six of them may be used, but it is wrong to weaken the patient by their application; and therefore great numbers of them, or a frequent repetition of their application, is wrong. When the pain is excessively severe, it is right to apply the extract of belladonna with the soap cerate.

Cerat. saponis ʒ j.
Ext. belladonna ʒ j.
Ol. lavendulæ gtt. v.
M.

Poultices. — If there be a disposition to suppurative inflammation in the tumour, it is right to use fomentations and poultices.

When the part is ulcerated and is granulating, the bismuth ointment is a good application; as it also is to an appearance of erysipelatous inflammation on the surrounding skin. The unguentum zinci oxydi, under similar circumstances, may be of service. Chalk and opium I have seen applied with advantage.

When the sore is excessively painful, the following powder should be rubbed upon the parts twice in the day:

Pulv. cinchonæ ʒ j.
—— opii ʒ j.
Misce.

If the surface of the sore manifests a disposition to slough, it is right to use a carrot poultice, or the nitric acid lotion.

When the arms swells, as it does on the diseased side towards the close of the complaint, it is necessary to apply a roller from the hand to the axilla, and to keep the arm from the side, to allow of as much freedom as possible to circulation and absorption, which are impeded in the axilla, if the arm approximates the side.

OF THE OPERATION OF REMOVING A SCIRRHOUS TUBERCLE.

Before the patient be submitted to the operation of having the disease in the breast removed, she will naturally inquire what danger it produces to life, and what prospect it affords of preventing a return. To the first of these the surgeon may confidently answer, that the danger of the operation is very slight; for, in the immense number of cases in which I have performed it, I have lost but five patients: two of erysipelatous fever and inflammation; one from hydrothorax, which was found upon dissection to be connected with the exterior of the disease into the chest, affecting the lungs and pleura; one, a woman of great bulk, in whom the breast was very large; and one from great age.

To the second question, the reply is made with more difficulty. A large proportion of cases return; but fewer than formerly, if the patient, immediately after recovering from the operation, undergoes an alterative course of medicine.

The only mode of relief. — It may be truly said, in the present state of our knowledge, the operation furnishes the only hope of preventing the disease from proving destructive, with the exception of very advanced age, in which it makes little inroad on the constitution, and little progress in the parts.

Although the patient may not ultimately survive;

yet it may be said, that in cases in which the disease does return, the patient is generally preserved from a most painful and offensive state by the operation preventing ulceration.

On these accounts, I recommend the patient to submit to it. Hope is revived, and the only chance for life is given.

Parts to be removed. — If the nipple be drawn in, it should be removed with the tumour: if any cords or roots can be felt proceeding from it, they ought to be removed; and if the skin adheres to the tumour, or be in the least inflamed on its surface, it ought to be removed.

It is not sufficient to remove the tumour, but the gland from the nipple to the tumour must be removed: and the surrounding parts, to some extent, must be taken away; for the disease does not consist in the tubercle only, but there are roots proceeding from it into the lobes of the breast in its vicinity. It will be sometimes necessary to remove the whole breast, where much is apparently contaminated; for there is more generally diseased than is perceived, and it is best not to leave any small portions of it, as tubercles reappear in them.

Mode of operating. — The operation consists in making two semicircular incisions, nearly perpendicularly, which meet at their points; one on the axillary side of the swelling, and the other on the sternal; the portion of skin over the disease should be removed. Each incision should reach the pectoralis muscle, which should be distinctly seen, and clearly exposed in the operation. As the arteries are divided, an assistant should apply his finger upon them, until the whole of the parts to be extirpated have been removed.

Removal of axillary glands. — If a gland in the axilla be enlarged, it should be removed, and with

it all the intervening cellular substance, as the absorbent vessels between the swelling and the gland are contaminated; for it is wrong, after removing a swelling from the breast, to make a separate incision to extirpate a gland; but it should be an extension of the first incision from the tumour to the gland.

If several glands in the axilla be enlarged, their removal does not succeed in preventing the return of the disease; some being still seated beyond the reach of the knife. I once saw the axillary vein opened in the operation of removing several of these glands; the gush of blood was considerable, but it was evidently of the venous character; and a dossil of lint, placed in the axilla, stopped the hæmorrhage, and the bleeding did not return.

Vessels carefully secured. — So soon as the operation is performed, the divided vessels are to be secured. From faintness and sickness the bleeding stops; but, as soon as action and warmth return, the vessels again bleed. It is therefore necessary to put a ligature upon each artery, for nothing is more annoying to a patient, or alarming to her friends, than after-hæmorrhages: the wound is obliged to be opened; the patient becomes faint; the bleeding stops, and the vessels concealed in coagula are difficult to find. Much time, pain, fatigue, and alarm are saved the patient, by attention in securing the vessels at the conclusion of the operation.

Use of a suture. — In dressing the wound, put a suture through its centre, for it produces adaptation, and preserves it better than adhesive plaster. I used to object to a suture, but experience has shown me its utility. The emplastrum thuris compositum and emplastrum saponis p. æq. is the best which can be applied, being less apt to produce erysipelas than the common adhesive plaster.

If erysipelas arise in the surrounding skin, apply flour or starch to the surface.

Arm to be supported. — The arm should be supported in a sling. The ligatures may be drawn away in seven or eight days.

In those cases in which there is a general scirrhous inflammation of the breast, I never now perform the operation, because I never knew it succeed. In others, in which a number of tubercles form in the breast, the whole mamma must be removed.

After-treatment. — So soon as the patient has recovered from the operation, a medical alterative treatment should be pursued, to change the constitution and prevent the disposition to a relapse into the former disease.

ON THE FUNGOUS OR MEDULLARY TUBERCLE.

Differs from scirrhus. — This disease differs in many respects from the scirrhous tubercle.

Occurs at all periods after puberty. — First, It occurs at all periods of life after the age of puberty, although still more frequently after thirty years of age, than earlier. One of the worst cases I have seen of the complaint appeared at the age of twelve years, and destroyed life at sixteen. It began at the period of the evolution of the breast. It was removed by an operation when of large size: a small tubercle reappeared, and it was also subjected to operation; but the disease again grew, and destroyed life.

Difference of feel. — Secondly, this disease is not so hard as the true scirrhus, but has more the feeling of chronic inflammation at its early stages; and as it increases it becomes softer, yields to the impression of the finger, but immediately again fills as the pressure is removed. At this period the skin is

of the natural colour, and it so continues whilst the tubercle is in its adhesive stage; but, after a few months, the skin becomes livid, and then a distinct fluctuation may be perceived from a fluid being found, which is contained in a cyst. The veins of the surrounding skin become extremely enlarged and varicose, and the surface assumes an inflammatory appearance, of a darker colour than common inflammation. The cyst next ulcerates; or if opened, in either case, discharges a fluid, which has the character of bile, composed of serum with red particles, somewhat changed in their colour: the fluid leaves a yellowish red stain upon paper, and readily coagulates, as serum does, by exposure to heat. The appearance of the fluid differs so entirely from that which is contained in the hydatid cyst, that any one acquainted with the two diseases readily distinguishes the one from the other by it.

After the cyst has been opened, a fungus sprouts forth, which occasionally bleeds profusely, but the bleeding is easily stopped by pressure; the discharge is excessive, wetting a handkerchief through in half an hour, and of a faint and most sickening odour; the edges become everted; a sloughing disposition manifests itself in some parts of the tumour, and occasionally in the whole of the swelling; and I have known the entire disease slough away. I remember, during my apprenticeship at this Hospital (St Thomas's,) Mr Cline had a case in which the tumour sloughed away, and the wound healed, after which the woman was discharged from the Hospital apparently cured; but I am not certain if the complaint did or did not return. In general, however, the profuse discharge, the repeated losses of blood, and the production of similar disease in other parts of the body, lead to the destruction of life. The patient falls a victim to this complaint much sooner

than to the scirrhous tubercle, in the majority of cases dying in a few months from the first discovery of the disease.

Less painful.—Thirdly, This disease differs from the true scirrhus in being much less painful; in its earlier stages it is altogether free from pain; and I have known it acquire great magnitude with little diseased sensation: even in its most formidable state it is seldom very sensitive.

Glands not affected.—Fourthly, The glands in the axilla are not generally inflamed in the same manner as in true scirrhus, by irritation or absorption; for I have known a person die of the disease without the axillary glands being affected: but in some instances they do participate in the disease. The cervical and internal mammary glands are also rarely affected.

Nipple not drawn in.—Fifthly, The nipple is not generally drawn in, nor is the skin puckered, having the appearance of cicatrix, as in true scirrhus.

Thus this disease may be distinguished from scirrhus by a less circumscribed and more diffused inflammation; by less hardness; by the formation of a cyst; by the extreme varicose state of the veins; by the fungus which sprouts from it after ulceration; by profuse bleedings; by extensive sloughing; by less pain; by a quicker progress to destruction; by the absence of retraction of the nipple; by the want of puckering of the skin; and by the glands being less affected in the course of absorption.

Health at first unaffected.—The patient's constitution at first appears to suffer but little; but after a time, when the process of ulceration begins, she becomes sallow and emaciated; and from the frequent losses of blood has an extremely cadaverous appearance.

Adhesive stages. — The tumour, in its adhesive stage, appears lobulated like an adipose swelling; but the substance, which is effused by the inflammation is more compact, and varies in colour; in some parts assuming the character of common adhesive matter, in others it is softer and mixed with red particles of blood. In its next stage it forms a cyst, which contains the fluid that I have described; and from its interior it is that the fungus growth proceeds, and this has the appearance, when cut through, of soft organized matter; in some parts extremely vascular, in others of the semblance of coagulated blood; other cysts are found containing bloody serum, and a semifluid mass, looking like putrid brain, or sometimes like cream tinged by the colouring particles of the blood.

Origin. — It adheres to tendinous structures more than others in its commencement; for example, to the aponeurosis of muscles, as that of the pectoral. I have seen tumours of this kind arise from the deltoid aponeurosis, from the sheath of the femoral vessels, and from the tunica sclerotica; but still the cellular structure, in each part of the body, may become affected by it. In the dissection then of these cases we meet with the glands in the axilla sometimes slightly enlarged; and next, tumours, in various parts of the cellular tissue, in great numbers; the lungs I have seen loaded with them: the liver is generally tuberculated, and I have seen one kidney affected. The uterus has soft tumours on its surface, and sometimes a polypus growing from its interior, which has been called by that able accoucheur, and excellent man, Mr Clarke, the cauliflower excrescence, or polypus uteri. I have known almost

every internal organ affected by it, even the brain itself.

CAUSE OF THE FUNGOID DISEASE.

Constitutional. — It is evident, in a disease which affects several different parts of the body, out of the line of absorption, that a constitutional cause must exist to produce it: yet it has also a local malignant action, so that a part shall become diseased whilst the surrounding parts still maintain their natural functions. Thus the disease is formed of a constitutional disposition to the complaint, with a local specific action. Upon removing these tumours, the surrounding surfaces generally heal rapidly, and without any malignant action being observed upon the wounded part. The incision, in removing these tumours, must, however, be extended into the healthy parts, at a considerable distance from the diseased; for if there be inflammation in the vicinity of the tumour, the malignant action will recur in it. I have known, in amputating a limb above the elbow, for this disease in the elbow joint, the skin inflamed between the elbow and shoulder, and the stump assumed the fungoid character. Carefully, therefore, avoid cutting near the diseased part, or the complaint will be certain to return.

Predisposing causes. — The predisposition to this disease in the constitution is founded upon anxiety of mind, and on those circumstances which have a tendency to destroy the regular and natural functions of the body.

TREATMENT.

As the disease is founded in a constitutional change, and in specific local action, the objects in the treat-

ment will be to correct the general health and to destroy the local and specific action. The first is to be attempted by the alterative medicines already recommended, viz,

Pil. hyd. subm. comp.

and a bitter infusion with rhubarb and soda.

But we are at present entirely unacquainted with any constitutional means, or local application, which has influence over the disease when it has once been manifested.

Pressure. — Pressure has been used to produce a slough of the fungus, and it is proper to give it a trial; but it is acting only upon the effect, and will not prevent a fatal termination, as the cause will still remain. Aluminous applications are useful in preventing the growth of the fungus, and the sulphate of iron has a good effect in the same point of view; but I know of nothing which has a specific action upon the sore.

Its removal by operation. — It is therefore necessary to remove this disease by operation; and, upon the whole, it less frequently returns than the scirrhous tubercle, if care be taken to extend the operation properly into the sound parts.

The operation presents none of those difficulties which have been described; for it has been said that the vessels are large, and that they bleed so profusely as to occasion dangerous hæmorrhage. It is true, in the swelling they are large: but the arteries of the surrounding parts are but little augmented, and I have never seen any dangerous bleeding from their division. It is certain that the veins particularly, and the arteries of the part, if cut, bleed freely; but they ought not to be divided in the operation, which should be extended beyond its limits: they bleed not only from their size, but from the difference in their structure, having little contractile power.

After the operation, as in scirrhus, the constitution will require an alterative treatment, to prevent the disposition to returning disease.

OF THE SIMPLE CHRONIC TUMOUR OF THE BREAST.

This disease is not of a malignant nature, nor does it produce any dangerous consequences. It attacks the young and the apparently healthy, seldom beginning after the age of thirty years; and usually appearing from the age of puberty to that period.

Appearance of the swelling. — The character of this swelling is as follows: — it is very superficial, growing rather upon the surface of the breast than in its interior. At first it feels like one of the mammary lobes being enlarged: and then, as if several were combined in one swelling. As it increases it becomes in some degree lost in the substance of the breast. It has not the hardness of the scirrhous tubercle, and it is not accompanied with the loss of health of the fungoid disease. It is an extremely moveable swelling. It is generally unaccompanied with pain, either in the part, or shoulder, or arm, although I have known exceptions to this rule. It grows very slowly and gradually, and does not generally acquire a great magnitude. I removed one which had existed five years, which was not larger than a walnut; and I have seen one which, after fifteen years, still remained but a small swelling.

Sometimes acquires a large size. — In a patient sent me to Guy's Hospital, by Mr Lukyn, of Feversham, the swelling had grown to a great magnitude, but still felt as if composed of a simple enlargement of the different lobes of the mammary gland. I have also seen one case, in Guy's Hospital, in which the disease became excessively large, and it ulcerated and destroyed life. They will be sometimes painful

at the period of menstruation: there is nothing malignant in their nature, and I have never known them change their action into the scirrhous or fungous disease, although under changes of the constitution such an event would be possible. The absorbent glands in the axilla are unaffected.

Diagnosis. — The diagnosis of this disease consists in the youth of the patient; in the absence from pain; in the appearance of general health; in the slow growth of the swelling; in its superficial situation at first; in its extreme mobility; in its feel being that of the lobes of the breast enlarged, and therefore it is a conglomerate tumour; the glands in the axilla being free from disease.

Dissection of the tumour. — Upon dissection, the swelling is found to be composed of a number of lobes connected together by a condensed cellular tissue, and which appear as enlargements of the lobes of the mammary gland. These lobes are composed of smaller, which by maceration may be separated. The appearance of the disease, when cut into, is that of sweet bread, that is lobulated in every part, or composed of large lobes, which are divisible into smaller.

Cause. — The cause of the disease is unknown. I have heard it frequently attributed, by the patient, to the pressure of the bones in her stays, or that of some part of her dress.

Treatment. — In the treatment of this disease little is effected by medicine. I generally order the emplast: ammon: c̄ hydrargyro to be applied to the part, and give hydrarg: c̄ cretâ with soda and rhubarb, but the disease rarely disappears. The great gratification which the patient receives in this case, is from the assurance that the complaint is not of a malignant nature.

Removal by operation. — If the disease increases in

spite of an alterative treatment, and the patient becomes anxious for its removal, there is very trifling risk from the operation, for I have frequently performed it at my own house, and the patients have returned home immediately afterwards. When, however, these swellings grow to a very large size, the vessels supplying them become extremely increased; and I remember seeing one removed from the left side, in which case the vessel that supplied the tumour was so large as to afford a gush of blood, which alarmed the surgeon, from the idea of their being some communication between the tumour and the interior of the chest. When they are small, as they usually remain, it is right to secure each vessel which continues to bleed, however slightly, or the wound will be obliged to be re-opened to secure it.

OF THE ADIPOSE TUMOUR.

In the breast a fatty swelling is sometimes formed. A Mrs Smith, of Great Yarmouth, applied to me, with an enormous tumour in her bosom. As her general health was good, I advised its removal. It weighed fourteen pounds and ten ounces: the gland of the breast was placed before it. The preparation is in the Museum at St Thomas's Hospital, and she recovered very quickly. The incision for its removal was thirty-two inches in circumference.

OF THE IRRITABLE TUMOUR.

Occurring in young persons. — This disease generally occurs in young women from the age of fifteen to thirty; the swelling never acquires magnitude, and is distinguished from those which I have described by the following circumstances:

Diagnosis. — A lobe of the breast is slightly swollen; it is extremely tender to the touch, and, if handled, the pain sometimes continues for several hours. The uneasiness is not seated in the swelling only, but extends to the shoulder and axilla, down the arm to the elbow, and frequently to the wrist and fingers. It is very much increased prior to menstruation, is somewhat relieved during the period, and decreases after its cessation. The pain is sometimes so severe as to destroy rest; and even the weight of the breast in bed is sometimes almost intolerably painful.

Produces vomiting. — When the pain is most severe, the stomach sympathizes, and vomiting is produced. The skin is undiscoloured, and there is no external mark of inflammation. Sometimes only a small portion of the breast is affected; at others, the greater part of the bosom; and I have known it affect the breast on each side.

The constitution is highly irritable and sensitive, the hair of the patient is usually light, the complexion extremely delicate, and the temperament sanguineous.

Continues for a long period. — I have often known this disease continue for many months, sometimes for years; and once during twelve years.

Not malignant. — It has not a malignant tendency, does not therefore produce any dangerous effect, and not only does not require an operation, but such a measure would be quite unjustifiable.

Very frequently this disease is accompanied with an amenorrhœa, or with great paucity of menstruation, paleness of its colour, and frequently it is attended with profuse fluor albus.

Cause. — Its causes are irritability of constitution, generally a defect of uterine secretion, and often its immediate exciting cause is a blow.

Local treatment. — In the treatment, local irritabili-

ty is to be diminished by the application of the belladonna in extract, or opium mixed with the ceratum cetacei; the extractum conii; or the recent conium in a poultice is beneficial. A plaster of soap cerate, to produce perspiration, or the application of hare skin, or some other fur, or the oiled silk applied with the same view, are to be found useful.

Leeches. — Leeches are sometimes employed when the pain is excessive, and the vessels of the breast are unusually full. If two frequently used, they produce debility, and add to the irritability of the system.

Constitutional treatment. — The constitutional treatment consists in diminishing constitutional irritability, by restoring defective secretion, in giving tone to the system, and in acting particularly on the uterine secretion.

Medicines. — The usual medicines are small doses of calomel and opium, combined with a mild aperient, but those which best agree are the mistura myrrhæ c̄ ferro, or the ferrum ammoniatum; under the continued use of which the disease gradually disappears. Rhubarb and soda, or these combined with columba, I have also seen very useful.

Conium, combined with rhubarb, I have known beneficial.

OF THE OSSIFIC TUMOUR OF THE BREAST.

Case. — The following is a case of this disease: — Mary Farmer, aged thirty-two, had a swelling in the breast for fourteen years, which had been painful during the later seven.

The pain was very severe: the skin over it felt hot, and required the constant application of evaporating lotions to keep it cool. The tumour was excessively hard, and very painful before menstruation, but greatly relieved after it.

Various applications, as poultices, fomentations, stimulating plasters, did not dispose it to suppurate; in short, all the means employed proved useless. When she consulted me, I thought, from the state of the health, the mobility of the tumour, and its peculiar feel, that it was not cancerous; but still I recommended its removal, to which she consented.

Dissection. — Upon examination of the swelling, after the operation, it was found to be composed in part of cartilage and in part of bone, the greater part of the former being ossified.

OF THE LACTEAL TUMOUR.

Symptoms. — Some time after delivery, a woman applies to a surgeon with a fluctuating tumour in the breast, of very considerable size, attended with painful distention, but without discolouration. The veins of the breast are very large. A lancet being put into the swelling, milk is discharged in large quantity, sometimes to the extent of several ounces; which, after it has stood for some time, separates a cream upon its surface.

Cause. — The cause of this complaint is the obstruction of one of the lactiferous tubes near the nipple, or in it.

Treatment. — Its treatment consists in leaving the opening made by the lancet to discharge the milk which that part of the breast secretes. The swelling then gradually subsides as the milk in the breast disappears.

I, in one case, saw great inflammation follow the opening; but still it is the only means of relief, unless when the opening be made the child be weaned, and the secretion of milk be arrested, and then the continuance of the opening will be unnecessary.

BREASTS LARGE AND PENDULOUS.

These glands sometimes grow to an enormous magnitude, about the age of twenty years, so as to hang down upon the abdomen, not from relaxation but from real increase. I saw a case of this kind in a young woman, aged twenty-three, which began three years prior to my seeing her; tender to the touch, of a dark red colour. She was often costive, but regular in her menstruation.

Dr Babington and myself witnessed the following case:

Case. — Miss L., aged seventeen years, of a light complexion and delicate constitution, who is naturally costive, has a remarkable enlargement of her breast. The left is twenty inches from its junction with the chest above to its lower part, and its circumference measures twenty-three inches. The nipple is flattened, the areola excessively expanded. The breast feels as if every lobe of the mammary gland was increased to several times its usual magnitude.

Treatment. — The treatment consists in supporting the breasts in a suspensory bandage, in which each breast is received, and this is fixed over the shoulders.

The medicine best calculated to be useful is hyd: c̄ cretâ with rhubarb and soda.

THE MILK ABSCESS.

Treatment. — This abscess requires the same general treatment in its adhesive, suppurative, and ulcerative stages, as we have recommended for abscesses of other parts. In general I leave them to break spontaneously; but there are two exceptions to this.

First, when the constitution and patient are suffering severely and the abscess is slow to break, it is right to assist nature with the lancet.

And, secondly, when the abscess forms at the back of the breast very deeply, the aid of an artificial opening is required.

Formation of sinuses. — When they ulcerate, sinuses, difficult to heal, are sometimes produced; and the best treatment is to inject them with a solution of sulphate of zinc, or a dilute sulphuric acid, and to apply it constantly over the breast by linen.

LECTURE XXII.

ON URINARY CALCULI.

Where seated. — Urinary calculi are found in the kidney, in the ureter, in the bladder, and in the urethra.

Calculi in the prostate, not urinary. — The calculi which are met with in the prostate gland, are not urinary; they are formed in the ducts of that gland, into which the urine does not gain access, and they generally differ from urinary calculi in their composition.

OF THE RENAL, OR KIDNEY CALCULUS.

Symptoms. — The symptoms by which the presence of a calculus in this organ is known are, 1st, pain in the loin, in the situation of the kidney, which pain extends forwards towards the navel accompanied with a sense of numbness in the bowels, and downwards to the spinous process of the ilium. The pain is of an obtuse kind, it often produces a sympathetic effect on the stomach, and occasions vomiting. The loin is so tender, that the least pressure on it occasions great suffering to the patient. The act of stooping, when a stone exists in the kidney, produces acute pain in the loins, and is sometimes followed by a discharge of bloody urine.

Case. — I knew a gentleman, who, in stooping on his horse to open a gate, felt severe pain in the

loins; he immediately discharged bloody urine, and afterwards felt the symptoms (hereafter to be described) of a stone passing from the kidney by the ureter. He voided this stone by the urethra, four days subsequent to the first attack of pain in the loins.

The presence of a stone in the kidney is sometimes manifested by extreme irritability of the bladder.

Case. — A chemist, in the city, had frequently consulted me (when I lived there) for an irritable state of his bladder and urethra, for which I had recommended various medicines, and bougies had been passed; but he did not experience any relief from their employment. After I left the city, I was informed that he was dead; and upon inspection of his body, no disease of the bladder or urethra was found, but a large stone was discovered in the kidney.

Sometimes removed by ulceration. — Nature sometimes succeeds in removing these extraneous bodies by a process of ulceration; an opening being formed in the loins, through which a stone can be felt, by passing a probe, and by which the calculus is ultimately discharged.

Case. — A person came to consult me from the country with two openings, one above and one below the last rib, through which three calculi had been discharged. Dr Marcet analyzed these, and found them to be composed of the ammoniaco-magnesian phosphate.

Opening to be dilated. — If the calculus cannot readily pass, from the small size of the opening, the aperture should be dilated by sponge tent; if this fails, a bistoury may be carefully used, as the artery and vein are before the stone.

A stone in the kidney, when very large, may, in

some instances, be felt through the loins. Mr Cline informed me, that a patient consulted him who had this disease, in whom he could distinctly feel the stone, by pressing firmly on the loins; the patient's general health would not at that time bear an operation, otherwise Mr Cline would have removed the stone by incision.

Upon dissection of persons dying with calculi in the kidney, there are found;

1st, Sometimes numerous small calculi, like grains of sand, in the tubuli uriniferi.

2dly, A stone, lodged in an infundibulum, or often several, occupying different infundibula.

3dly, A large stone in the pelvis of the kidney, connected by processes to others, seated in the infundibula.

Kidney enlarged. — The kidney is sometimes scarcely altered in its size, at others it becomes considerably enlarged. If the stone interrupts the passage of the urine to the ureter, the glandular structure of the kidney becomes absorbed, the pelvis and infundibula extremely enlarged, and these membranous bags with the capsule of the kidney only remain.

Ulcerates. — Sometimes ulceration of the kidney is produced; it enlarges, then wastes, and gradually becomes in a great degree absorbed; matter is discharged with the urine; high constitutional irritation succeeds, and if both kidneys be affected, the life of the patient is destroyed.

TREATMENT.

Medical. — The medical treatment of stone in the kidney consists in giving the liquor potassæ; the carbonate of potash, or soda; not that they dissolve the stone, but they prevent the formation of uric

acid; the stone becomes encrusted with triple phosphate, which is a softer substance, and, perhaps, less irritating to the surfaces on which it rests; these medicines also deaden the sensibility of the organ itself. If much pain be felt in the loin, the daily exhibition of a purgative, occasional cupping, or the application of a blister to the loins, will be useful. If there be a suppurative discharge, an issue should be made in the lumbar region.

OF STONE IN THE URETER.

Symptoms. — The presence of a calculus in this tube is shown by pain being felt near the spinous process of the ilium, and in the direction of the psoas muscle, if pressure be made upon it through the abdominal muscles; the pain extends in the course of the anterior crural nerve, as the stone descends over the lumbar nerves which form it; also to the testicle, as the stone passes the spermatic plexus; and spasmodic contractions of the cremastic muscle occur, as it passes under the spermatic vessels. The patient is sick, often vomits, is covered with a cold perspiration, and is unusually pallid.

Case. — The pain is sometimes so severe, that a gentleman, who had several times suffered from this disease, informed me, that once, when a quarter of a mile from his house, he was seized with this pain, and fell on the ground, being unable to walk until his servants came to his assistance, and carried him home.

Pain not constant. — The pain has remissions, and the patient is flattered with the hope of the stone having passed the ureter; but, after a few minutes, it returns with equal violence, and it is only after repeated attacks that it escapes into the bladder.

Calculi in the ureter, I have known destroy life in the following instances:

Case. — Mr Cline had removed a stone from a boy in St Thomas's Hospital, by the operation of lithotomy; the boy had recovered from the operation, when he was seized with rigors, great pain in the course of the ureter, and vomiting; a swelling formed just above the seat of the cœcum, in the right iliac region, which gradually increased, and the boy's constitution quickly gave way. On examination after his death, the pelvis of the kidney and the ureter were found distended with matter; and at the end of the ureter, near the bladder, a stone was discovered, which had prevented the escape of the urine and of matter into the bladder, and thus occasioned death. The preparation of the diseased parts is in the Museum at St Thomas's Hospital.

Case. — Mr Hallam, of Walworth, gave me a preparation of a stone, stopped in the ureter, which was taken from a patient of his, who had for a length of time discharged matter from the colon per anum; nature had formed an opening for the escape of the urine and pus, in this case, first by producing adhesion between the ureter and colon, and then by making a communication between the two by a subsequent ulcerative process.

Case. — We have another curious preparation of a stone in the ureter, surrounded by an abscess, taken from a patient who came to my house for advice. She had great pain in her loins, and tenderness in her abdomen, with so much fever as led me to suppose that she had but little time to live; I advised her to apply to a Mr Smart, a surgeon, in my neighbourhood in the city, who sent to inform me, a few days after, that she was dead, and that he had permission to inspect the body. Upon making an incision into the abdomen, there issued a strong urinous smell, and a watery fluid, mixed with matter.

The intestines were inflamed and adherent; the bladder was small; one kidney was much enlarged and the other unaltered; the ureter of the enlarged kidney was greatly increased in size and full of matter, it was completely closed at the lower part by a calculus, and had given way above, so as to allow of the escape of the urine and matter into the abdomen.

A caclulus may be discharged from the ureter by ulceration through the muscles of the abdomen.

Case. — Mr Stone, of Mayfield, Sussex, gave me a calculus, which was discharged from a man who worked as a gardener. An abscess formed near the anterior superior spinous process of the ilium, from which this calculus and a quantity of matter were discharged. The man recovered.

TREATMENT.

Bleeding. — If the pain is very severe during the passage of the stone, the patient should be bled largely, to produce relaxation of the ureter, that it may yield to the pressure of the stone and urine, and he should be put into the warm bath, to aid such relaxation. Opium and the liquor potassæ should be given, to allay irritability; and the abdomen should be fomented and gently rubbed from above downwards, in the course of the ureter, in order to assist mechanically the passage of the calculus.

OF STONE IN THE BLADDER.

Symptoms. — The symptoms change so soon as the stone quits the ureter and enters the bladder; the patient is relieved from the pain in the course of the ureter, in the testis, and thigh, but suffers usually in the following manner:

Pain in the urethra and at the frænum. — 1st. He experiences acute pain, particularly opposite to the frænum, but also along the course of the urethra; this varies in its degree, more according to the irritability of the patient, than the form or roughness of the calculus: the pain is sometimes slight, but generally severe, and is described by the patient as a cutting sensation; or, sometimes, as if boiling water or lead were passing through the urethra. Relief is experienced by pressing on the glans penis, and adult persons do so; children nip and draw the prepuce until the latter becomes excessively elongated; they also, under severe suffering, after passing urine, cross their legs, and press upon the organs of generation with great force.

The adult, when voiding his urine, often rests his head against the wall, bends his knees, and relaxes the muscles generally.

Pain after the discharge of urine. — The pain is felt more after discharging the urine, when the bladder contracts around the stone, than before it is voided.

Frequently the fæces pass at the same time with the urine, and a prolapsus ani is a common consequence of the excessive action of the muscles of the perineum and lower opening of the pelvis, more especially in children. I have seen the abdominal muscles thrown into violent spasmodic actions for sometime after the discharge of the urine, in some of the worst cases of stone.

Bladder irritable. — The bladder is very irritable, is capable of retaining but little urine, and becomes diminished in size.

Sudden stop to the flow of urine. — Often, as the urine is discharging, a sudden stop to its flow is produced with violent pain, from a stone falling on the beginning of the urethra and acting as a valve; as

the force of the bladder's contraction lessens, the stone recedes a little, and the urine again escapes. Patients, therefore, pass their urine best in a recumbent posture, as the stone does not then fall upon the neck of the bladder.

At first no change is produced in the appearance of the urine, which can direct the judgment; but when the disease has existed for some time, and more especially from violent exercise on horseback, or in a rough carriage, the urine becomes bloody. A person having a stone in the bladder cannot ride far on horseback without dismounting to pass his urine; and is obliged to quit a carriage often for the same reason.

Discharge of mucus. — As the disease increases the bladder becomes more irritable, the urine is loaded with mucus, and sometimes precipitates a white sediment, composed of flakes of adhesive matter, thrown out by the mucous membrane of the bladder, when it has become inflamed. This state is often attended with rigors, succeeded by heat, and other symptoms of intermittent fever, and matter is sometimes discharged with the urine. The mucous membrane of the bladder becomes ulcerated when a stone has existed long; the patient loses his health; is incapable of getting sufficient rest; and thus he is destroyed by the disease.

A person labouring under this complaint walks with excessive care; he does not raise his feet much from the ground, to prevent any shock to the body, which would create pain and occasion spasmodic action of the bladder; he also lies down with great caution, as the sudden change of posture might alter the position of the stone and produce irritation.

Mucous coat. — In examining persons who die with a stone in the bladder, the mucous membrane appears loaded with blood, it is thickened, and highly villous. Its muscular coat is much increased, and the capacity of the bladder lessened. Numerous sacculi are sometimes formed, the mucous membrane being forced between some of the muscular fibres, and, in these bags, stones are wholly or partially received. We have a preparation in the Museum showing this state of the bladder, with stones lodged in these sacculi.

Ulceration of the mucous coat. — I have seen ulceration of the mucous membrane, and we have an example of stones ulcerating the basis of the prostate, and making their way into the urethra.

Bladder contracted in part. — We have also another very curious specimen, in which the upper part of the bladder had contracted around the stone, whilst the lower part is in the natural state.

A stone is often found with an enlarged state of the prostate gland; and in some cases is met with in a bag, formed directly behind the prostate.

Hour-glass contraction. — We have a preparation showing an hour-glass contraction of the bladder, in which one large stone is lodged in the superior part, and several in the inferior; and another, exhibiting a stone in the bladder, with a large fungus growing from the prostate gland.

Ureters. — The ureters are dilated, the kidneys enlarged; sometimes one is enlarged and the other wasted from an ulcerative process.

Size of calculi. — The size of calculi generally varies from a drachm to two ounces; but the weight is not always proportioned to the size, but depends upon the composition of the stone.

The largest stone, which I have successfully extracted, weighed near six ounces. At the Norfolk and Norwich Hospital there is one of eight ounces. Mr Mayo, of Winchester, removed one, in fractured portions, of fifteen ounces. I have one in my possession which I extracted, but not successfully, weighing sixteen ounces. We have a model of a stone, given to the collection by Mr Foster, which, I understand, was twenty-five ounces in weight. One in Trinity College library, at Cambridge, weighs thirty-two ounces and seven drachms. But the largest stone which has been found in the human body is that given to the College of Surgeons by Sir James Earle, this weighed forty-four ounces.

Pain not more severe from a large stone. — The severity of the symptoms is often in an inverse ratio to the size of the stone; which, when it is very large, produces less pain, because the urine dribbles away, or is voided by very slight contraction of the bladder.

Number of calculi. — The number of calculi is very various; but in the majority of cases only one is found; two or more not unfrequently exist. I have extracted nine in one case, thirty-seven in another, and the greatest number I ever extracted in the operation was one hundred and forty-two; these were from Mr Allis, of Worcester, a patient of Mr Carden; I have them now in my possession, many of them are about the size of marbles.

Removal of a number of stones not dangerous. — A great number of stones does not add much to the patient's danger in the operation; for it is not the frequent introduction of the forceps into the bladder, but the violence which is used in extracting the stone or stones which produces mischief; thus the removal of one large stone is more to be dreaded than that of many small.

Stones rounded or hollowed, when more than one. — When more than one calculus exists, the first ex-

tracted is found smooth, and often hollowed by the friction of the others; so that the form of the first shows the existence of a second or more.

Form of stones. — The form of stone varies extremely; but when there is only one, it is generally oblong; when more than one, they are usually rounded and smooth; and when very large, they assume the form of the bladder.

Surface of stones. — The surface of stones is sometimes smooth, as the uric acid calculus; a little irregular when composed of triple phosphate; and very rough if formed of the oxalate of lime: this latter is called the mulberry calculus. But the severity of the symptoms does not always depend on the irregularity of the surface of the stone, but on the irritability of the bladder.

Composed of lamellæ. — Calculi are generally composed of concentric lamellæ, formed upon a centre, called the nucleus. The colour of the different layers varies considerably, and the materials of which they are composed are of very different nature: some calculi are brown, some are white.

Nuclei. — The nucleus, or centre, is often some extraneous body introduced into the bladder, as a portion of coagulated blood, a piece of bougie, or catheter.

In the collection at St Thomas's Hospital are preparations exhibiting various foreign bodies, as forming the nuclei to stones; as a portion of slate pencil; a needle, which had traversed a part of the body previous to its entering the bladder; also a piece of tobacco pipe, which had been introduced into the urethra by the patient, to relieve some impediment to the passage of the urine, it broke and passed into his bladder, and was extracted some time afterwards by Mr Godwin, surgeon, at Derby,

with a stone formed around it. Sometimes a small stone of uric acid forms in the kidney, and descending by the ureter into the bladder, it there acquires an increase from the formation of a calculous deposit on it, of a different nature.

COMPOSITION OF URINARY CALCULI.

My friend, Dr Dowler, who has paid much attention to the analysis of these calculi, has favoured me with the following account:

Urinary calculi of the human body may be comprehended under the following species.

1. Lithic acid, or uric acid calculus.
2. Lithate of ammonia.
3. Phosphate of lime, or bone earth.
4. Triple phosphate, or phosphate of magnesia and ammonia.
5. Oxalate of lime, or mulberry calculus.
6. Cystic oxide.

Besides these, other substances have been mentioned as forming distinct species of calculi, such as xanthic acid, carbonate of lime, and the fibrinous calculi; but they are of extremely rare occurrence.

The above calculi present the following chemical characters.

1.* Lithic acid calculus. Before the blowpipe it blackens and emits a peculiar smell, somewhat resembling that of burnt feathers; it is soluble in the caustic fixed alkaline solutions by the assistance of heat, and is again precipitated from these by the addition of an acid. The nitric acid dissolves and decomposes it with effervescence; if the solution be evaporated to dryness, a new acid, called the pur-

* I have omitted every character which is not essential to the particular species. — D.

puric, and ammonia are formed; these, uniting, produce a purpurate of ammonia, which is of a pink colour, and soluble in water.

2. Lithate of ammonia. By the addition of a caustic fixed alkali, ammonia will be disengaged. The lithic acid may be shown by treatment with nitric acid, as in the former instance. When mixed with triple phosphate, its presence is ascertained with difficulty. It is more soluble in water than the lithic acid calculus, and is of a clay colour; but its characters have not as yet been sufficiently investigated.

3. Phosphate of lime. Before the blowpipe, it first blackens, then becomes white, and afterwards resists the action of heat. If, after being heated in order to decompose the contained animal matter, it be dissolved in very dilute nitric acid, the subsequent addition of nitrate of silver will produce a yellow precipitate, which is a phosphate of silver, and of course indicates the presence of phosphoric acid. The lime may be detected by adding oxalate of ammonia to the above nitric solution.

4. Triple phosphate. Before the blowpipe, it emits an ammoniacal smell, becomes reduced in size, and at length melts with difficulty. The caustic fixed alkalies disengage ammonia. It is very soluble in dilute acids, and the subsequent addition of ammonia causes it to be precipitated in a crystalline form.

5. Oxalate of lime. When heated by the blowpipe it swells, its oxalic acid is decomposed, and the lime is left in the caustic state. When digested with carbonate of potash, a double decomposition follows; and the oxalate of potash, thus formed, presents its peculiar characters, which are indicative of the presence of oxalic acid.

6. Cystic oxide. This calculus may be readily

distinguished by its external appearance. Before the blowpipe it emits a peculiar and fœtid odour. It is soluble in a solution of the neutral carbonates of soda and potash; also in those of the caustic alkalies, and most of the acids. Its solution in nitric acid is precipitated by alcohol.

The Xanthic oxide, of which only one specimen has as yet been observed, was so named by Dr Marcet, from the circumstance of its producing a peculiar yellow compound with nitric acid.

Carbonate of lime is sometimes, but very rarely, met with, forming small urinary calculi. These effervesce in dilute muriatic acid, and a precipitate is formed by the addition of oxalate of ammonia to the muriatic solution.

The fibrinous calculus, observed by Dr Marcet, was probably formed from the fibrin of blood which had accidentally escaped into the bladder: it possessed the usual character of fibrin.

Mr Brande analyzed one hundred and fifty stones, from the collection of Mr Hunter, and the materials of which they were composed were as follow:

Uric acid	16
Uric acid plus, triple phosphate minus	45
Uric acid minus, triple phospate plus	66
Triple phosphate	12
Uric acid on phospate nuclei	5
Oxalate of lime	6

In addition to these, Dr Wollaston found one of the cystic oxide; but Dr Marcet met with this stone in the kidney: it is not composed of lamellæ, like the other calculi.

TREATMENT.

Medical treatment. — With respect to the medical treatment of calculi, I do not believe in the power of chemistry to dissolve a stone in the bladder, if it acquire any considerable magnitude. The medicines, given for this purpose, become so much changed in their passage through the circulating and secreting system, that their chemical influence is in a great measure destroyed. They may alter the surface of a stone, so as to render it soft and less irritating; but they do not prevent a calculous secretion.

Case. — Dr Baillie and myself attended a gentleman from Birmingham, who secreted a large quantity of triple phosphate, which appeared in white crystals in his urine: we gave him the muriatic acid, and the secretion of the triple phosphate ceased, but uric acid was produced in equal abundance: he had then alkalies given to him, and the triple phosphate reappeared; he was at length, but not under many months, cured by attention to his diet and general health.

Case. — I had a patient in Guy's Hospital with a stone in his bladder, in whom various experiments were tried to dissolve the stone by chemical menstrua. A catheter was introduced into the bladder, and through it injections were thrown; thus an opportunity was given for a direct application of the menstruum to the stone. After a lapse of time, I said to this man, 'Well, have my medical friends dissolved the stone?' his answer was, 'No, Sir, and I have given up all the injections except opium, from which I receive considerable relief.' The patient died in the Hospital, and, on examination after death, a stone was found in his bladder.

Alkalies may lessen the sufferings. — But although a stone cannot be dissolved in the bladder, yet the irritability of the latter may be so far diminished by alkaline remedies, as to enable the patient to bear the disease with much less suffering.

Case. — Admiral Douglas was the subject of stone; I sounded him, and in the evening of that day a portion of the stone was discharged by the urethra, and I sent it to my friend Dr Marcet for analysis, who found it to be oxalate of lime; I therefore gave him acids, but he was not relieved by their use; he then took subcarbonate of soda ʒss. four times in the day, in some water. Some months afterwards I was requested to meet Dr Reynolds and Sir E. Home in consultation upon the case of the Duke of Portland; and when I entered the room, Sir Everard said, 'Cooper, how did you dissolve the stone in Admiral Douglas?' to which I answered, 'I never dissolved a stone in my life.' — 'But,' said Sir Everard, 'he expresses himself well from some medicine you ordered him.' I called in consequence on the Admiral at his hotel; when he said, 'You saw me in dreadful agony, unable to cross a room; but since I have taken the soda, I went from Yarmouth, in Norfolk, to Portsmouth by land, and bore the journey well; and I could now go down a country dance.' Yet the stone still existed in his bladder; but the soda had lessened its sensibility, so as to enable him to bear the complaint without much suffering, and only a little inconvenience from the stone, which still occasionally stopped the flow of urine.

Magnesia and soda. — Magnesia and soda have been recommended together; but as many stones are magnesian, the use of the former medicine may be improper.

Diluents. — Great dilution relieves the severity of the symptoms, and more specially mucilaginous drinks.

Stomachic medicines. — Medicines which assist the digestive process are the most appropriate to prevent this disease, as it is often the result of taking food which is difficult of digestion; or of a weakened state of the stomach, which renders common food indigestible.

Disease returns. — After removing a stone from the bladder, a medical treatment should be adopted, to prevent a return of the disease. The uric acid and oxalate of lime calculi return less frequently than the triple phosphate, which are very often reproduced.

Case. — I cut a Mr Miles for the stone, and removed a triple phosphate calculus; in about twelve months the disease returned, for I sounded him, and found a stone. Mr Lyford, an excellent surgeon at Winchester, extracted this stone by the usual operation; yet, on examination of this gentleman's body after his death, which occurred several months subsequent to the second operation, several calculi were found in his bladder.

In another case, in which I extracted a triple phosphate calculus, from a patient of Mr Van Oven's, in the city; the disease returned, and I again performed the operation, and found a large coagulum of blood in the bladder, surrounded by a triple phosphate deposit.

LECTURE XXIII.

OF THE OPERATION OF LITHOTOMY.

Previous inquiries. — Before performing the operation for the stone, it is right to enquire carefully if the functions of the body are well performed in other respects: If the digestion be tolerably good, and the breathing and circulation be free. For if the liver be diseased; if the chest be oppressed; or if the heart have an irregular action, the patient does not in general recover from the operation. Pain in the loins, vomiting, or the discharge of matter, indicating disease of the kidneys, also form insuperable objections to the operation.

Case. — A patient came into Guy's Hospital to be cut for the stone; I sounded him and found a calculus, but he made water almost immediately, and at the time discharged a considerable quantity of matter. I saw that he was emaciated; he complained of pain in his loins, and his stomach was much disordered. I therefore said, 'I will not operate upon this man, for he would die from the operation.' In less than a month he died, and I was happy that I had not operated, as one kidney was found wasted, and the other at least twice its natural size, with its cavities full of a purulent secretion.

The success of one surgeon being greater than that of another chiefly depends upon his judgment in this respect, viz, not to operate when there is much functional or any organic disease.

The age of the patient. — The age of the patient does not much influence the result of the opera-

tion, with the exception I shall mention. Old age is not to be a bar to it, if, so far as the stone will permit, the patient be active, and has no other complaints. I generally, therefore, say to a patient, 'If the stone were removed, would you be capable of taking exercise? is your digestion good? is your breathing free?' — If he answers, Yes, the operation may be performed.

Mr Cline operated successfully upon a patient at 82: Mr Attenborough, of Nottingham, at a still more advanced age. I operated upon a gentleman aged 76, who had been near sixty years in the island of Jamaica: I performed the operation in 1812, and he died about ten years after, having returned to Jamaica and enjoyed his health there.

Sixty a favourable age. — About sixty years of age is the period at which stone is most frequent in the adult, and then the operation is very successful. In the middle period of life, fever is more violent from the operation, and the patient is often too much loaded with adeps to be submitted to it. Fat persons do not generally bear operations well, they have little vital power; they should be reduced by diet and medicine, and they must be accustomed to irritation of the bladder, by the frequent introduction of the sound; but still they have more fever and disposition to peritoneal inflammation, than at a later period of life.

The most favourable age. — The age at which there is least danger from the operation is from three to twenty, for death is then a very rare occurrence. Under the age of two years, children often become convulsed and die from the operation, on account of their excessive irritability.

Average number of deaths. — The number of deaths from the operation, taking all ages, is one to eight. Fat persons at all periods, but more especially in

middle life, are those who most frequently die. A surgeon sometimes proceeds to twenty or even thirty cases with extraordinary success; but then he loses several patients, which still produces the average I have experienced.

Previous preparations. — A short time prior to the operation, in addition to the exhibition of purgatives, &c, an enema should be administered, in order to empty the large intestines, and particularly the rectum, which, if distended with fæculent matter, would be in great danger of being wounded.

OF THE OPERATION.

The table. — The table, on which the patient is to be placed, should be two feet six inches high; it is to be covered with two blankets and a sheet, and several pillows are required to support the patient's head and back.

Bandages. — Three bandages are required to secure the patient; of these, two are employed to confine each hand and foot of the same side together: a loop, at one extremity, is first passed around the wrist, and the patient then grasps the outer side of the foot, about its middle, having the bandage passing from the wrist between the two; the bandage is then passed under the foot, brought round on its inner side over the instep, and so round the wrist and ankle; after two or three turns around these parts, it should be passed over the hand and under the foot, then to the wrist and ankle again, until the whole is used. The other bandage is to be placed round the back part of the neck, and each extremity being passed under the ham of the same side from within to without, they are to be carried back and tied behind the neck. These bandages prevent the patient from making any movements likely to

impede the operation, or occasion danger during its performance.

Instruments, 1*st*, *The sound.* — The instruments required are, 1st, a sound, consisting of a solid portion of steel, curved as the urethra, about twelve inches in length; its thickness should be well proportioned to the size of the urethra.

State of the bladder when sounding. — Persons often require to be sounded with their bladder full, and with it empty. I have frequently found a stone directly after the urine has been discharged, which I could not perceive when there was much urine in the bladder. It is right, therefore, to sound the patient first with his bladder full; and, if the stone cannot be felt, then to have it emptied, and sound again. On this account, it is often useful to employ a silver catheter, at first preventing the escape of the urine, and afterwards allowing it to flow through the instrument, at the same time continuing to sound. When the bladder is empty, it frequently happens, however, that the instrument is so confined that it cannot be moved sufficiently to strike the stone.

Position of the patient. — The patient should be sounded first in the recumbent position, and if the stone be not then felt, in the erect; as the calculus, by falling upon the urethra in the latter posture, may be easily detected.

Stone not always detected. — I have myself sounded and not detected a stone at one time, which I have afterwards felt. I have sounded and not discovered a stone, which another surgeon has afterwards perceived. I cut a patient, and extracted thirty-seven stones from his bladder, who had been sounded and declared not to have a stone.

Those who have not had experience in this disease, and have not frequently sounded patients afflicted with it, sometimes mistake the extremity of the sacrum, or the os coccygis, for a stone.

The staff. — The next instrument is the staff, which is somewhat similar to the sound, but rather more curved, and having a groove on its convex part; this groove should be as large as possible; 1st, because it is more easily cut into; 2dly, because the gorget or knife passes more readily by it into the bladder.

How to be held. — When performing the operation, the staff is to be held by an assistant, perpendicularly, or nearly so; and its extremity should, if possible, rest upon the stone; its groove is to be slightly inclined to the left side of the rapha of the perineum. Nothing can be more unsafe than to incline the handle of the instrument towards the patient's abdomen, as it draws its point out of the bladder into the urethra; and when the gorget or knife are passed on it towards the bladder, either is likely to slip between it and the rectum.

Position of the patient during the operation. — Before commencing the first incision, the surgeon should see that the patient be placed evenly upon the table, so that one side be not higher than the other; and also that the shoulders be sufficiently raised and well supported.

The scalpel. — The knife, for commencing the incision in perineo, should have a considerable convex cutting edge, as by it the urethra is more freely opened. The scrotum being elevated, the incision is begun opposite the under part of the arch of the pubis, and is continued on the left side of the rapha, along the perineum, as far as mid-way between the tuberosity of the ischium and the anus.

The first incision. — The first incision shoulddivide the skin, &c, and expose the accelerator urinæ; the second should be carried between the left crus penis and the bulb; the latter being pressed towards

the right side by the fore finger of the surgeon's left hand.

A part of the accelerator urinæ is divided, and the transversus perinei should be freely cut, as it forms a great impediment to the extraction of the stone, if undivided.

Opening the urethra. — The next incision should be made into the groove of the staff, by cutting into the membranous portion of the urethra; for this purpose the knife must be directed upwards, and not horizontally, otherwise the rectum is endangered: the opening made to expose the groove of the staff should be an inch in length.

A gorget, or a knife with a probed extremity, is next usually employed, to complete the opening into the bladder.

The gorget. — The gorget may be considered as the divider of the prostate gland, and it also serves as a director to the forceps. It was formerly used with a blunt edge, so that it acted as a wedge: when so formed and employed, the scalpel should be carried along the groove of the staff, so as to divide the prostate gland laterally, after the urethra has been opened, which allows the blunt gorget to enter the bladder with comparative facility. The operation performed with this instrument is attended with very little bleeding, and has been very successful in its issue.

Cutting gorget. — Hawkins had one of the edges of the blunt gorget made cutting. Mr Cline made the greatest improvement upon the cutting gorget, in having the left side entirely removed, leaving only the beak and its right blade, which had a sharp anterior edge: this instrument enters with ease. It should be introduced horizontally, for there is considerable hæmorrhage if it be introduced obliquely, as it then opens a plexus of vessels surrounding the

prostate, and which is continued to the vesiculæ seminales, and terminates in the internal iliac veins.

Hæmorrhage. — It is quite contrary to my experience to say, that persons do not die of hæmorrhage after this operation, for I have known many instances of it; four in particular, in which death was the immediate consequence of bleeding, suffered to continue for several hours; and several I have known die from gangrene of the scrotum occurring after severe hæmorrhage. The patient should never be left until the bleeding has ceased; and, if it be very considerable, the surgeon should place his finger within the wound and compress the bleeding vessel; but he should be careful not to quit his patient whilst any hæmorrhage remains.

It is best to use a small cutting gorget, as it lessens the danger of wounding blood vessels; and then, if necessary, on account of the size of the stone, to dilate the wound, do it with the blunt gorget.

Mode of passing the gorget. — The beak of the cutting gorget is passed into the groove of the staff, where it has been previously opened at the membranous part, and the instrument is then pushed along the groove into the bladder, so as to divide the left half of the prostate gland. It is necessary to press the beak against the groove as it glides along, and occasionally to move it slightly backwards and forwards, to be certain that no portion of membrane has got between the two: when the gorget enters the bladder, the urine flows out over its superior concave surface.

Size of the gorget. — The length of the gorget should be proportioned to the size of the patient. The breadth of its cutting part, when used for an adult, should not exceed one inch; and the blunt gorget should be used, if the first opening be not sufficiently free.

The gorget which I at first used in my own operations was double, and cut upon both edges; but I thought it occasioned too much bleeding, and divided more than was absolutely necessary for the removal of the stone.

The knife. — The knife is now frequently substituted for the gorget, and that which I for some time employed, in various cases, was straight and narrow, with a probed end.* After opening the membranous part of the urethra, as before, I passed this knife along the groove of the staff into the bladder. In the young this answers very well, and also in a thin adult; but in a deep perineum, or enlarged prostate gland, I prefer the gorget, as being more definitive in its cut.

The forceps. — Forceps of various sizes are also required to lay hold of the stone, and those employed must depend on the bulk of the patient: the handles should occupy two-thirds, and the blades one-third of the length. I have tried many others of different proportions, but think that which I have mentioned the best. Some of the blades must be flat, for small stones, or fragments of stones; some should be curved, to remove calculi from behind the pubes or prostate: one pair should be large, as small forceps will not retain a large stone in their grasp, with sufficient firmness to extract it.

The forceps must be passed along the groove of the gorget with great care, and the gorget must be well retained during their passage. I have seen the forceps pass between the bladder and rectum, from the surgeon's pulling back the gorget as he thrust forwards the forceps, which should never be done.

* Mr Thos Blizard, who was an excellent and successful operator, employed a knife of the same kind, excepting that the beak was at an angle with the blade, instead of straight.

The gorget must not be removed until the surgeon has thrust his finger forwards to feel that the groove of the staff has been freely opened. I frequently, if the perineum be not very deep, remove the gorget after it has entered the bladder; and introduce the forceps by my finger, carried along the groove of the staff.

Mode of using the forceps. — When the forceps have passed into the bladder, the gorget and staff are to be removed; and the surgeon, before opening the forceps, should sound with them for the stone. When the situation of the calculus has been thus ascertained, the blades of the forceps are to be separated and the stone received between them; and this must be done with great gentleness, not only to save the patient pain, but to prevent any injury to the internal surface of the bladder.

When the stone is drawn down to the opening in the perineum, wait a little for the cessation of muscular action from the perineal muscles, and introduce the finger by the side of the forceps, to feel if any obstruction exists, and to press it out of the way of the stone; for the finger is the best instrument for this purpose. It is right to turn one blade of the forceps to the pubes and the other to the rectum, as the stone cannot then injure the urethra. If the extraction of the stone be violently resisted, disengage and remove the forceps, then introduce the finger and feel how the stone is placed, and, if necessary, turn its long axis into the direction of the long axis of the bladder.

Having grasped the stone with the forceps, do not be hasty in extracting it, but be gentle in the employment of your power, depending upon the gradual rather than the sudden exertion of force. The great danger, and the most frequent cause of death, in my opinion, arises from the surgeon's em-

ploying excessive violence with the forceps. 1st, Bruising the bladder: 2dly, Disengaging it from its situation by tearing down its natural adhesions; it injures the peritoneum and brings on peritoneal inflammation: 3dly, It injures the prostate, sometimes tears the urethra at the membranous portion; and I have known the rectum lacerated where it had not been injured by the incisions, which can only arise, in the use of the knife, from ignorance or negligence.

If the stone cannot be grasped with the straight forceps, a curved pair should be employed.

The operation for the stone consists, therefore, 1st, in opening the membranous part of the urethra, and dividing the transverse perineal muscles on the left side with the knife, and exposing the groove of the staff: 2dly, in dividing the left half of the prostate gland horizontally, and that portion of the bladder connected with it, by means of the gorget for probed knife: 3dly, in introducing the forceps, by which the stone is seized and extracted.

OF THE DIFFICULTIES AND DANGERS OF THE OPERATION FOR THE STONE.

Stricture in the urethra. — If the urethra be the subject of stricture, do not perform the operation until it will admit a large staff. The strictures being removed, the operation is less difficult, and the recovery quicker and more certain.

Enlarged prostate. — An enlarged prostate gland offers great difficulties to the operator, and if the stone be of large size, the patient will seldom recover, as the impediment to extraction is excessive, and the violence obliged to be used such as the patient can ill bear, at the period of life at which such disease of the prostate occurs. It is, therefore, in such cases, a very fortunate event when the stone

breaks, as it is removed with less risk to the patient, although it renders the operation tedious.

Lateral enlargement. — A lateral enlargement of the prostate gland produces less difficulty, if it be freely divided, than the enlargement of the middle lobe; and this gland should be always examined per anum in aged persons, to prevent the surgeon being baffled by this disease, and if he finds it enlarged laterally, he must use a large gorget, or else divide freely with the knife.

Middle enlargement. — If it be an enlargement of the third lobe, the circumstance is known by the passage of the staff, which only enters the bladder by its handle being greatly depressed; also by the stone being felt distinctly at one time and not at another; and here let me observe, that when this happens in sounding, I have generally found some difficulty in the operation. The curved forceps are proper to be used in this form of disease.

Sac behind the prostate. — The enlarged prostate gland often gives rise to another difficulty, by occasioning a sac to be formed immediately behind it, in which the stone is principally lodged, its extremity only projecting into the bladder, so as to be felt by the forceps; in this case the curved forceps are required, and the finger must be passed up the rectum, to raise the stone from this situation, and to bring it into the axis of the bladder.

Part of the prostate nearly detached. — A portion of the postrate is sometimes nearly separated in extracting the stone, so as to be afterwards pendulous into the bladder; this occasions symptoms somewhat similar to those of the stone to remain. This happened to Mr Cline, who operated upon a gentleman very successfully as to the immediate result, but who, after his recovery from the operation, found all the symptoms of stone return. He lived a long

time after, and before his death desired that his body might be opened. Mr Ramsden inspected the parts, and sent me the bladder, which is now in the collection as St Thomas's Hospital, and a portion of the prostate gland hangs by a narrow neck into the bladder; this portion, by falling on the urethra, produced the symptoms.

Enlargement of the third lobe. — From the enlargement of the third lobe of the prostate gland, little advantage is, on the same account, derived from the operation of lithotomy, as the patient still experiences all the symptoms of stone, excepting that the urine is not usually bloody; but even this circumstance I have known to happen.

Contraction of the bladder. — I have seen a difficulty arise in performing this operation, from a partial contraction of the bladder, by which the stone has been firmly embraced, so as to impede the use of the forceps. This arises from the sudden escape of the urine which the bladder contained previous to the operation. The fundus of the bladder, and half of the organ near to it, embrace the stone closely, the forceps are passed into the anterior part of the bladder and opened at its cervix; but, in attempting to seize the stone, only one of its extremities is nipped by the forceps, which slip from it immediately the surgeon tries to extract the calculus; this occurs several times, until the patient becomes exhausted, when the contraction of the bladder subsides, and then the stone is readily seized. In such a case, the flat forceps answer best, gliding most easily over the stone. If the patient does not retain his urine for a long period before the operation, this difficulty seldom occurs.

Narrow pelvis. — In persons who have been the subject of rickets, the pelvis is sometimes so narrow as to render the performance of this operation ex-

cessively difficult. I once saw Mr Cline operate in a case of this kind, and only his coolness and perseverance could have overcome the obstacles it presented. The subject was a child; the tuberosities of the ischia were very near each other, and when the forceeps were introduced into the bladder, only the handles remained external to the wound; the extremity of the stone only could be caught hold of, and from this the forceps repeatedly slipped. Mr C. finding that the longest pair of forceps, usually employed for children, would not reach beyond the centre of the stone, and that it could not be held by them, introduced a pair of forceps made for an adult, and with these he succeeded in grasping the stone, but the opening of the pelvis was too small to admit of its being extracted whole; he, however, after repeated efforts, broke the calculus with the forceps, and removed it by fragments. The child afterwards recovered.

Large stone. — The stone is sometimes so large as to produce great difficulty in the extraction. The largest which I have successfully removed has been between five and six ounces; but I remember to have seen one in the Norwich Hospital which weighed eight ounces, and was extracted without being broken. If broken, a very large stone may be successfully removed. Mr Mayo, of Winchester, in this way, extracted one weighing altogether fifteen ounces. The largest which I have extracted whole was from Mr ——, of Fore Street, in the city, a relation of Mr Field's, surgeon, in Wilderness Row; it weighed sixteen ounces; I was obliged to extend the incision in perineo to the sacro sciatic ligaments, and when I seized the stone with the largest forceps, I found I could not extract it; I therefore endeavoured to bore a hole in it with a gimlet, as I held it between the blades of the forceps, but scarcely made

any impression upon it: at last I succeeded in removing it in the following manner: Mr David Babington, son of Dr Babington, then my apprentice (a most amiable and excellent young man, who entirely fell a victim to his professional zeal, and who, if he had lived, promised to be one of the highest ornaments of his profession,) assisted me. I placed a single blade, or crotchet, on the upper part of the stone, under the symphisis pubis, and then, whilst I pulled the stone with the forceps through the opening in perineo, Mr B. pressed down the stone by elevating the handle of the crotchet, and thus brought it below the line of the symphisis pubis, and thus it was extracted. The time occupied by the operation was nearly an hour, and the patient survived only a few hours.

Forceps with blades which separate.—For extracting very large calculi, a free incision is required, and the forceps must be large and strong. Mr Cline had some made so that the blades could be introduced singly and joined together afterwards; or one blade could be used alone, as above described.

Instrument to break large stones.—Forceps have been constructed with teeth, to break a large stone; and Mr Earle has invented a perforator for the same purpose: such an instrument, easily applied, is in the highest degree desirable.

Soft stones.—Soft stones create a difficulty in the operation, by rendering it necessary to remove the stone in fragments. It is thought to be very desirable afterwards to wash out the bladder by means of a syringe, with a view to prevent the future formation on any remaining portion. I believe it is better to use the scoop, and to remove with it all the particles of stone which the urine cannot carry off, as sand; for injecting the bladder will not remove fragments, and the after-flow of urine through the wound will remove sand.

Unnecessarily broken. — Stones are often broken which might be removed whole, if the surgeon were less violent, and more cautious. The mode of preventing them from breaking is, when the stone has been seized with the forceps, to put the thumb between the handles, so as to prevent them violently approximating, and to limit the degree of pressure.

Number of stones. — A number of calculi render the operation more tedious, but not so dangerous as one large stone. It is not the number of times that the forceps are introduced, but the violence used with them, which endangers the patient. When there are several in the bladder, care must be taken that none be left; and the surgeon must not be content with examining by the forceps only, but it is best to pass a sound into the bladder, either by the urethra or by the wound, to feel if any remain; he should also pass his finger into the rectum and raise the prostatic part of the bladder, so as to throw any stone lodged there into the axis of the bladder; as it often happens that the prostate gland is enlarged when several stones exist, and they are generally situated behind this enlargement.

Calculi not always detected. — In the instances of the greatest number of calculi which I have seen, it was doubted for a length of time if any existed; yet, in one case, the urine had been repeatedly drawn off, and in the other the patient had been several times sounded, but a stone could not be felt: — on examination, after the patient's death, fifty-six stones were found in the bladder.

Form of the stone. — The form of the stone sometimes adds to the difficulty of its extraction; if its long axis much exceeds its breadth, when seized by the forceps in the centre it will not pass the opening in the bladder, from its extremities projecting on each side of the forceps: the surgeon, finding

great resistance, should withdraw the forceps, and passing his finger into the bladder, he should turn the stone, and place its long axis from the fundus to the cervix, after which it can be easily extracted.

Sacculi enclosing stones. — Sacculi in the bladder sometimes enclose stones so far, that only the end projects into its natural cavity, and can be alone felt by the forceps. In my own practice I have met with only one decided case of this kind, which was the following:

Case. — A boy was admitted into Guy's Hospital, in whose bladder, by sounding, I found a stone; but the symptoms were less urgent than usual, and each time I sounded the stone was felt in the same part of the bladder. This led me to examine per rectum, and I then perceived a stone lodged and fixed at the under part of the bladder over the rectum, I therefore made an incision between the bladder and rectum in perineo, and, directed by my finger in the rectum, I reached the stone without wounding either the rectum or bladder; I then opened the sac with the knife, and seizing the stone with a pair of dressing forceps, I extracted it. The boy for three days only passed his urine by the wound, and then it took its natural course, and the wound healed rapidly.

Case. — In a case which I attended with Mr James, surgeon, at Croydon, he found, on inspection of the body after death, two calculi, having large extremities connected by a narrow stem, one extremity of each was situated in a sac, and the other extremity in the cavity of the bladder.

As I have stated, a sacculus behind an enlarged prostate gland is a frequent occurrence, but the calculi are only occasionally falling into its cavity.

Corpulency. — Corpulency greatly increases the danger of the operation, as well as its difficulty.

The perineum is often so deep as to render it impossible to reach the bladder with the finger; and, if the stone be large, the impediments to its extraction are greatly augmented, by the resistance afforded by the perineum.

Prolapsus ani. — When a child has been long subject to prolapsus ani, it often becomes troublesome at the time of the operation. The anus should be supported by an assistant at the time the surgeon commences the operation, or it protrudes whilst he is making his incision. It may be observed, that in cases in which the prolapsus happens after opening the bladder, that if the instruments be withdrawn, they cannot again be introduced until the prolapsus be returned.

OF THE CAUSES OF DEATH FROM THE OPERATION.

The causes of death from lithotomy which I have witnessed are:

Nervous irritability in children. — 1st, Nervous irritability occurring in very young persons: they are generally pale and almost comatose on the day after the operation: on the day following, their eyes roll quickly, and there is excessive restlessness; they then become extremely weak, are convulsed, and expire. To relieve this irritable state, calomel and opium are the best remedies.

Peritoneal inflammation. — 2dly, Peritoneal inflammation, occurring when much violence has been used in extracting the stone.

The symptoms are; vomiting, tenderness in the region of the bladder, tension of the abdomen, and difficulty in procuring motions.

The treatment consists in administering calomel purges, in applying fomentations, leeches, and blisters to the abdomen; in bleeding from the arm, and the use of the warm bath.

In inspecting these cases, I have seen not only inflammation of the bladder and peritoneum, but extravasation of blood between the bladder, pubes, and abdominal muscles, showing that the bladder had been drawn down during the extraction of the stone. The removal of a large stone, when the prostate gland is enlarged, kills in the same manner.

Hæmorrhage. — 3rdly, Hæmorrhage. This I have seen repeatedly destroy life, and it has been with no small degree of surprise that I have heard it denied to be a cause of death.

Case. — I cut a man in Guy's Hospital at one o'clock in the day; the operation was soon over, and apparently under the happiest auspices; the patient was put to bed, and I soon after quitted the Hospital. In the afternoon the man became faint and vomited several times. At nine o'clock in the evening the sister of the ward, in turning down the bed-clothes, found the lower part of his body surrounded with blood, and the man was extremely faint. Mr Callaway, my apprentice, was sent for, but the patient died in an hour.

A surgeon should not quit his patient until the bleeding caused by the operation has ceased: the patient should not be put to bed whilst any hæmorrhage continues; and when in bed he should be very lightly covered for some time.

I find that bleeding more frequently occurs when the gorget is passed obliquely, in the direction of the external wound, than when it is passed horizontally.

Gangrene of the scrotum. — 4thly, Gangrene of the scrotum. This I have seen several times, in persons who have been of intemperate habits, or in those extremely weakened by age.

Extravasation of urine. — 5thly, Extravasation of urine into the scrotum, producing great inflammation and swelling, and leading to gangrene; it arises from the incision being made too high, so as to open the cellular tissue of the scrotum.

Scrotum to be supported. — After the operation of lithotomy, the scrotum should be always supported by a bandage, to prevent the urine which flows through the wound, from irritating it, and thus the disposition to gangrene is lessened.

Ulceration of the bladder. — 6thly, An ulcerated state of the bladder, shown by offensive urine, evacuation of mucus and of pus, mixed with blood, in some, are sufficient to lead to a fatal issue in lithotomy.

Diseased kidney. — 7thly, Diseased kidneys, whether inflamed, wasted, suppurating, ulcerated, or containing stones; marked by pain in the loins, by purulent discharge, and by a disordered stomach.

Visceral disease. — 8thly, Visceral disease, as a morbid state of the liver; dyspnœa from some chronic affection of the lungs; palpitation of the heart; irregular or intermitting pulse; which tend to destroy the powers of restoration.

OF THE AFTER-TREATMENT.

When the operation is concluded the patient is unbound; but the legs should not be immediately brought together if any bleeding continue, as the blood is apt to pass back into the bladder, where it coagulates; and producing great urgency to make water, the coagulum is forced out, occasioning a renewal of the hæmorrhage.

To be kept dry. — No dressing is to be applied to

the wound, but a folded sheet or napkin is to be placed under the nates of the patient in bed, and this should be frequently examined, to ascertain if the urine be secreted and pass away: it should be changed for a dry one whenever it becomes wet.

Opium. — Opium may be given, if the patient be very irritable; but as it is apt to check the action of the intestines it should not be administered unless absolutely necessary.

Diluents. — The patient should be allowed to take diluents freely at first; such as linseed tea, or barley water with gum acacia in it; and, when the danger of inflammation has passed, beef tea, broth, or gruel may be given.

Saline medicines, with excess of alkali, are useful; if a tendency to fever or inflammation arises, purge the patient with castor oil, and foment the abdomen; if it increase, give calomel and antimony, and occasionally castor oil; if the pain in the abdomen become severe, bleed from the arm of the adult, and apply leeches to the abdomen of a child.

Tying the legs together. — When the wound begins to granulate, and not before, tie the legs together; as much mischief arises from doing so, soon after the operation; 1st, in bleeding, as already mentioned; 2dly, it prevents the free escape of the urine; it is of no use until the wound be disposed to close.

Position. — It is not necessary that the patient should rest on his back only; there is not any danger in his turning to the side, and great relief is often obtained by it.

Passage of the urine. — The urine passes, in some cases, entirely by the urethra in the first few hours, but this is not desirable; the patient suffers less in its discharge, and has less local irritation, if it escapes

easily by the wound. In cases of enlarged prostate gland, it is proper to introduce a flexible catheter by the urethra, to permit the urine constantly to flow off. When the urine, under the common consequences of the operation, takes its natural course, the patient frequently suffers from a rigor.

Recovery. — Children usually recover from the operation in about three weeks, and adults in about a month; sometimes both have the wound healed within a shorter period.

Evils following the operation. — I have known two evils arise from the operation; one, a loss of the power of the retention of urine, when the patient is obliged to wear a yoke, or jugum; the other, an interruption to the passage of the semen, from some injury done to the veru montanum, where the united ducts of the vesiculæ seminales and vasa deferentia terminate.

Case. — A gentleman, I know, who has undergone this operation, has pain in coitu, but does not pass any semen, although he experiences the orgasm.

The patient's digestion and state of urine require to be attended to after the operation, to prevent a return of the disease.

Mr Key, surgeon of Guy's Hospital, performs the operation of lithotomy in a different manner from that usually adopted. The points in which it differs from that commonly performed consist in the employment of a staff, nearly straight, and a scalpel formed knife, which serves both for the external incision and for the division of the prostate gland, thus obviating the necessity for a change of instruments. The staff is slightly curved for about an inch from its extremity, to enable it to pass more easily over the prostate gland, and the knife is about twice the length of a common scalpel. The mode

of performing the operation is as follows: the patient being secured, and the staff introduced into the bladder, an assistant is to hold the handle of the instrument inclined somewhat toward the operator, in order to keep its extremity projecting some way into the base of the bladder. The staff having been fairly laid open by the usual free external incision, and the point of the knife being steadily pressed against the groove, the operator takes the handle of the staff in his left hand, and lowers it till he feels his hand checked by the ligament of the pubic arch. In this movement of the staff, the prostate is raised from the rectum, the ligament of the arch acting the part of a fulcrum, and the staff that of a lever, by which the gut is put out of danger of being wounded. The groove of the staff and the edge of the knife are then to be turned, by an easy simultaneous movement of both hands, in the direction most favourable for the free division of the prostate, which will be about an angle of 50° with the horizon. The knife is now to be carried gently along the groove through the prostate into the bladder, until the gland is completely divided, which the operator easily ascertains, by the resistance afforded to the knife ceasing.

In passing the knife, to complete the section of the prostate, its handle should be lowered to the bottom of the external incision, by which a sufficiently large angle is formed between the knife and staff, and thus an opening in the gland is made, large enough to admit the extraction of a moderate sized stone. When the stone is of unusual dimensions, or the prostate increased in size, it will be advisable to dilate the opening in withdrawing the knife, in the same manner as when the beaked knife is used; in common cases the knife may be withdrawn along

the groove of the staff without the necessity of dilating.*

OF THE HIGH OPERATION, OR THAT ABOVE THE PUBES.

Not successful. — Attempts have been made to revive this operation, in this country and in France; but in England, hitherto, they have been very unsuccessful.

* As far as my own experience goes, I think the knife a much better instrument to divide the prostate with than the gorget; more violence is necessary to introduce the latter, and the opening made by it is limited to the width of the instrument: so that if a large stone be found much force is required to extract it, or the opening must be enlarged. With the knife, the surgeon may at once make a free incision through the prostate, which I consider a great advantage, as laceration or bruising of this part, by violence used in extracting the stone, is the most frequent cause of subsequent inflammation.

I have always made use of a long slender knife, with a probed extremity, of the same form as that mentioned by Sir Astley. During the early part of my apprenticeship to Sir A. C. he always used this instrument; and the success of his operations, performed with it, was greater than that which attended the employment of the gorget during the latter period of my time.

The probed extremity prevents the danger of wounding the posterior part of the bladder, supposing it to be in an empty and contracted state at the time the knife be introduced, which might happen with an instrument having a sharp extremity.

I have had an opportunity of using this knife in one case, in which great enlargement of the prostate existed; I did not find any difficulty in dividing the prostate; the operation was tedious on account of the stone being soft, so that I was obliged to extract it in pieces; but the patient, who was 73 years of age, perfectly recovered.

Out of nine other cases, in which I have used the probed knife, one only has terminated fatally: most of these patients were young, and otherwise healthy.

The blade of the knife, which I used in the case of enlarged prostate, was longer than that usually employed. — T.

Preferable under peculiar circumstances. — Those who have witnessed the general safety and facility in performing the lateral operation will never make use of the high operation, but under peculiar circumstances; as when the prostate gland is very much enlarged, or when a stone of great size exists. My opinion is, that it should be confined to a combination of these two circumstances (viz, the large stone and large prostate,) which render the operation in perineo very unsuccessful. Those who wish to be fully informed on this subject will consult the work of Mr Carpue, who has taken great and very laudable pains to explain this operation.

OF REMOVING STONES FROM THE BLADDER BY THE URETHRO-VESICAL FORCEPS.*

Number of calculi. — When a great number of calculi are found in the bladder, there is generally an enlargement of the prostate gland, and a sacculus formed in the bladder directly behind it. In these cases the bladder is rarely emptied completely of its fluid contents, and calculi form from the urine retained in the sac.

Usually small. — Such stones do not in general acquire the magnitude of those formed under the usual circumstances; and from their number and friction against each other, their surfaces are generally smooth, and their shape rounded. Fifty-six such calculi were found in the bladder of Mr Perkins, the brewer, who died from retention of urine.

Sometimes passed with the urine. — Persons who labour under this form of the disease sometimes pass the smaller of the calculi whilst making water; but

* These observations and cases have been already published in the Medico-Chirurgical Transactions, vols xi, and xii.

the larger still remain, producing retention of urine, and the operation of lithotomy has often been performed for them; but, as the following cases will prove, they may be extracted from the bladder by means which do not expose the patient to any loss of blood, do not occasion the slightest danger, or any very considerable degree of suffering.

I am fully aware of the impossibility of extracting large urinary calculi by the means which are here recommended; yet I cannot but feel a hope that they may be removed, in the early stages of the disease, by the following means, before they acquire a bulk too large to pass by the urethra.

In the infant also, it will be extremely difficult to contrive an instrument of sufficient delicacy to be introduced into the bladder through the urethra, which shall possess such a degree of strength as to enable it to grasp the stone firmly, and to extract it with safety.

Instrument for extracting small stones. — The instrument which I first had made for the purpose of removing these calculi, was merely a common pair of forceps, made of the size of a sound, and similarly curved; but Mr Weiss, surgeons' instrument maker in the Strand, showed me a pair of bullet forceps, which he thought would, with a little alteration, better answer the purpose I had in view. He removed two of the blades of these forceps (for there were four,) and gave them the form of the instrument which I had constructed; the blades of this instrument could be opened whilst in the bladder, by means of a stilette, so as to grasp and confine the stone; it gave but little pain on its introduction, but when opened to its greatest extent, and stones were admitted between its blades, their removal was painful, more particularly at the glans penis, which appears to be the portion of the ure-

thra furnishing the greatest resistance to their removal.

I shall now proceed to detail the circumstances of the first case, as they have been related by the patient himself.

Case, as related by the Rev. Mr Bullen.

The Rev. John Bullen, of Barnwell, near Cambridge, aged 64, of a spare habit of body and of a sanguine temperament, having enjoyed an uninterrupted state of good health, capable of partaking largely of the amusement of hunting, and living always with great moderation, was attacked, in May 1818, with symptoms, of which he gives the following account:

'I was suddenly seized with a frequent inclination to pass my water, and an uneasy sensation along the course of the urethra, which continued with greater or less violence for about a fortnight, when I was surprised by the appearance of a small round white stone at the orifice of the passage. The escape of this small calculus, which was attended with scarcely any pain, failed to produce any beneficial effect on my former symptoms, which continued unabated, both as to the degree of irritation and the frequency of making water. In this state I remained till June following, during which month several similar calculi passed, to the number of about thirty, producing no other inconvenience than a slight smarting pain along the urethra. At the end of June, without any assignable cause, I was suddenly relieved from this discharge of calculous matter, and from every other symptom but that of a frequent desire to void my urine, which latter inconvenience occasioned me no feelings of anxiety or apprehension.

'In the ensuing winter, I was seized with pains

across the back and loins; for which Mr Brewster, of Cambridge, supposing they proceeded from gravel, ordered me medicines, which he considered likely to alleviate them, but without producing any permanent good effect.

'I was, however, still enabled to pursue my favourite amusement of hunting, though frequently obliged to dismount to make water; at this time making no alteration from my accustomed mode of living.

'Without any material change I remained until the December of 1819, when I found the exercise of riding was becoming considerably more painful, and the inclination to pass my water more frequent, attended with some degree of difficulty in its passage, and a change, from its usual colour and clearness, to a fluid resembling chocolate. For these symptoms several formulæ of medicines having been prescribed without any material benefit, I was induced to consult Mr Abbott, a most respectable surgeon at Cambridge, who ordered me medicines highly beneficial in their first effects; the relief, however, they afforded me, was but of short duration, for my symptoms recurred with all their former violence; and though the prescriptions were repeatedly altered at Mr Abbott's suggestion, no sensible impression could, by the most judicious treatment, be made on the disease.

'My friend, Dr Thackeray, of Cambridge, was, in the June following, called in consultation with Mr Abbott; and both agreeing that the symptoms were produced by stone in the bladder, the sound was introduced to ascertain its presence, but failed to discover it. My symptoms continuing unabated, Mr Abbott, a fortnight afterwards, still impressed with the idea of stone, again sounded me; but the stones, for the reasons hereafter given, escaped de-

tection. To relieve my frequent inclination to make water, and to mitigate the pain I experienced in its discharge, I was recommended the use of an opiate glyster at bed-time, which afforded me considerable relief; but if the injection were omitted but for a single night, the symptoms returned with all their former violence.

'In this state of suffering I determined to consult Mr Astley Cooper, and on the 17th of August went to town for that purpose. Mr Cooper, suspecting from my account that a stone was present in the bladder, sounded me; but after searching for some minutes was unable to detect one; he then directed me to discharge the water from my bladder, and the sound being again introduced was distinctly heard to strike upon a stone. He then informed me that there was no hope of permanent relief but from the operation of Lithotomy; at the same time remarking that, as I had not been sufficiently reduc ed by the irritation of the disease to render me a favourable subject for the operation, it would be better for me to return to Cambridge, and by pursuing a certain plan of diet and regimen, to reduce the high health which I appeared to possess. He also prescribed alkaline medicine, for the purpose of lessening irritation. With this advice I returned home, where I remained till October, 1820, pursuing the use of the soda and the opiate injection. My sufferings being alleviated only for the moment, and seeing no probability of experiencing further relief from medicine; on the 23d of October I came to London to submit myself to the operation, and the 30th was the day proposed for its performance.

'On the day appointed, Mr Cooper, his nephew Mr B. Cooper, and Mr Merriman, junr, attended at my house. Upon sounding me, the instrument

could be distinctly heard, by every person present and even by myself, to strike against a stone. Mr Cooper, however, was of opinion that the stone was so small, as to admit of extraction without cutting into the bladder; and, therefore, determined not to perform the operation, but told me that he would try less dangerous means to rid me of this complaint; and happily under these circumstances the operation was deferred.

'On the 3d of November, I called at Mr Cooper's house, when he passed a full sized bougie into the bladder, for the purpose as he said, of dilating the urethra, and thus giving the stone an opportunity of passing with the flow of urine. This operation was repeated on the 6th, 10th, and 13th of November; but on the 14th an inflammation took place in the prostate gland, from the introduction of the bougies, and put a stop to the prosecution of this plan of treatment. The effect of this inflammation was a retention of urine, rendering it necessary for Mr Cooper to draw off my water every twenty-four hours; at which time the calculus could always be distinctly felt by the catheter. After the inflammation had subsided, the power of making water not having returned, Mr Cooper passed an elastic catheter into my bladder, and directed me to wear it; teaching me, at the same time, how to withdraw it when it became either painful or obstructed; and, on several occasions, I discovered small white stones in the opening of the instrument similar to those which had passed in 1818. Mr Cooper, upon being acquainted with this circumstance, expressed a wish to remove the instrument himself; when, upon withdrawing it, a stone was seen large enough to fill the opening in the side of the elastic catheter. The passage of these calculi suggested to Mr Cooper the possibility of inventing an instrument by which he might re-

move those that remained in the bladder; and on the 23d of November he brought with him some instruments contrived for the purpose; one of which he directly employed, and was so fortunate in the first trial as to remove eight calculi of small size. The operation was productive of a very inconsiderable degree of pain.

'On the 28th, eight more were removed by the same means, of a larger size than the former, two being as big as horse-beans. This operation was attended with even less pain than the former.

'On the 30th eleven were extracted; three or four being engaged each time the instrument was withdrawn. The removal of these gave me great relief, for I was immediately enabled to pass a considerable quantity of urine by my natural efforts; and previously to this, ever since the large bougie had been introduced, I had been unable to pass my water without the aid of the catheter.

'On the 8th of December six stones were removed by the same means.

'On the 13th, nine more were taken away.

'On the 19th, three more were extracted.

'On the 23d, twelve more were removed; thus only allowing the intermission of a day or two for the irritation to go off. The operations were repeated until eighty-four calculi were, by these means, extracted from my bladder; when Mr Cooper pronounced, after a most careful examination, they were all removed. My health has been all this time uninterruptedly good, with the exception of the attack of retention of urine from the use of the large bougie; and I am now able to discharge my urine without the use of the catheter, and to walk nearly as well as I ever did.'

The following case is, in part, detailed from the patient's account of his symptoms; and, in part,

from the statement of Sir Gilbert Blane, who is the patient's physician.

Sir William Bellingham's Account of his Case.

'Sir William B—— is in his 67th year; he suffered much at times from long and severe attacks of gout, from about his 35th to his 60th year; since which period the attacks have been much less frequent, much mitigated, and of short continuance. He thinks he first perceived red gravel or sand to come from him occasionally, soon after a long fit of the gout about seven or eight years since, but did not suffer much inconvenience from it. About four years since, he passed pieces of gravel at different times, and has continued occasionally to do so ever since; sometimes larger than a pea, but generally of an oblong shape. When they occasioned any stoppage in the passage, he used a hot bath at 94° and drank plentifully of some diluting drink, which, after a little time, relieved him. In the summer of the year 1820, having had occasion to use a great deal of walking exercise in London; for three or four days he was much surprised on passing, first, a considerable quantity of very dark stuff, nearly like coffee grounds; and afterwards a considerable quantity of, what appeared chiefly, blood. He did not experience any pain of consequence with this; and by the following day his urine was as clear as before. Upon going into the country, he found that if he rode fast at any time, it brought on the passing of the dark stuff, and afterwards, if persisted in, of blood. By degrees he gave up riding, and finally ceased to ride about Christmas last; and finding the same effects to arise in a slighter degree from walking much, he has very nearly given up that also, for the last six months. Sir Astley Cooper and Sir

Gilbert Blane attended him for these symptoms, in June and July 1821, when he left London for Ireland; whilst there, he continued to experience the same inconvenience as before, with but little pain, and the same on his return to London. Early in June last, he called on Sir Astley Cooper to say he was going again to Ireland, and wished to have some conversation with him, when Sir Astley Cooper advised his being sounded; which he then was, and it was ascertained that there was a stone. As it appeared, to Sir Astley Cooper, to be a small one, he proposed trying to extract it; and on the fourth trial, with intervals of a week or so between them, a stone weighing seventeen grains and a half was extracted on the 18th of July. About three weeks after, Sir William, having some fears that there still remained some stone behind, again applied to Sir Astley Cooper, who upon sounding found that such was the case; and on making at that time at his house an attempt to extract, he brought it part of the way, but found it too large to bring forward, and therefore returned it; and, as soon after as the parts would permit, he commenced enlarging the passage by bougies, which he continued at intervals for nearly a fortnight, and then extracted a stone weighing fifty-four grains, on the 28th of August 1822.'

Sir William B. suffered pain in making water; swelling of the corpus spongiosum at the scrotum, with considerable urethral discharge, until September 23d, when the symptoms subsided, under the application of fomentations and poultices.

When the size of the stone is observed, it will not excite surprise that I had considerable difficulty in extracting the larger, which weighed fifty-four grains. It was in that part of the urethra near the glans that the chief impediment was found; and, if I had thought proper to do so, I could have easily remov-

ed it from thence by incision, but I preferred completing the extraction without occasioning a wound. Yet I am now disposed to believe, that in a stone of equal magnitude, it would be better to make a small incision into the urethra, anteriorly to the scrotum, than employ force for the extraction of the stone through this narrower part of the urethra. A. C.

Mr King's Case.

Mr William King, aged 66, mariner, residing at Rochester, was sent to me by Mr Newsom, surgeon, of Rochester, on account of his having symptoms of the stone.

He came to London on the 29th of October 1822, and on the 30th he visited me. I sounded him, and found that he had, as Mr Newsom supposed, calculi in the bladder. I passed the urethral forceps into the bladder, and in a few minutes extracted four calculi; and although I could still perceive that some remained in the bladder, I did not choose to risk the production of any considerable degree of irritation; but advised him to come on November 1st, to have the operation repeated.

On the 1st of November I extracted three calculi; on the 4th, five more; on the 7th, twelve calculi; on the 11th, two; and on the 13th, three more. I then examined the bladder with care, but could not perceive any more stones; and, even before the removal of the last, he had experienced considerable dimunition of the pain in making water, and of the difficulty in passing it.

It is delightful to hear the expressions of gratitude which this patient pours forth for the relief which he has experienced from these operations, under which he has suffered but a slight degree of pain, and has never for a moment been confined from whatever exercise he was disposed to take.

Some years ago he passed red sand (uric acid;) but for several months before he had symptoms of the stone, he had not perceived any.

Case. — I have lately removed from a young person (a patient of Mr Rutherford, in Ratcliffe Highway,) of the name of Errington, a calculus of moderate size, and enabled two others to pass, by withdrawing the instrument in its dilated state, and thus extended the urethra, in such a degree, that the stones passed in the afternoon of the same day in a copious discharge of the urine.

I have heard that it has been stated, that there was no novelty either in this idea or in the instrument. To this I have only to observe, that if the idea had previously occurred to any individual, he had so far buried it in his bosom that I had never heard of it; and, as to the instrument, I am quite sure that Mr Weiss consulted no musty volume for its formation; for, so soon as I mentioned my wish, that he should construct a pair of forceps by dividing a sound in its middle, and giving it a joint two inches from its end, he, without quitting me, observed that he should make them to open, in the mode in which he now makes them. Mr Weiss has a strong and ingenious mind, and does not use petty artifices to obtain employment or character. But let us for a moment suppose (what I do not believe) that the idea had occurred to others, and the instrument had been made centuries ago, what are we to say of the apathy of those bright ornaments of their profession, Cheselden, Pott, Hunter, Cline, Home, Blizard, &c, who, if they had heard of such an instrument, had never employed it?

OF BREAKING OR SAWING STONES IN THE BLADDER.

An instrument for the purpose of breaking stones in the bladder (called lithontripteur) has been invented; and, during the last year, successfully employed in Paris, by Mons. Civiale.

A description of the instrument, of the mode of using it, and an account of three cases in which it has succeeded, have been published from a Report of the Royal Academy of Sciences.

The size and straight form of the lithontripteur render it only applicable to peculiar cases. The urethra must have acquired its full growth, and the prostate gland must be in a healthy state, or the instrument cannot be employed with safety: even then the urethra must, in most cases, be gradually dilated by the passage of bougies, before the operation can be performed. When introduced into the bladder, the lithontripteur is not calculated to seize a large stone, as the claws or holders do not separate to a sufficient width to grasp it, which cannot be remedied unless the size of the instrument be increased, or the springs weakened.

The lithontripteur is therefore only adapted to the case of an adult, having a sound state of urethra and prostate, provided the calculus be also of a moderate size.

This instrument has not as yet been successfully employed in this country.

Mr Weiss, whose name I have already had occasion to mention, has made an instrument, which is well calculated to break stones of small size, and of not very hard consistence: it is on the same plan as the urethro-vesical forceps, but having strong springs. He is now engaged in perfecting an instrument, which will divide a stone into minute pieces by means of a saw.

OF CALCULI IN THE URETHRA.

They may be best described in the three situations in which the surgeon is called upon to aid their passage, or to remove them by operation; viz, 1st, in the membranous part of the urethra; 2dly, above the scrotum; 3dly, opposite the frænum.

In the membranous part. — If you are consulted on account of a stone being arrested in its progress at the membranous portion of the canal, you find the patient having the strongest desire to void his urine; but able only to pass a few drops, with dreadful agony. You introduce a catheter into the membranous part of the urethra, and, feeling a stone grate against its extremity, you should immediately withdraw it, and pass a bougie as large as the passage will admit; when this touches the stone it should be left in, and the patient should be directed to sit in water as hot as he can bear it, and continue it as long as he can; at the same time he should take opium with small doses of tartarized antimony. In half an hour, or an hour, withdraw the bougie, whilst the patient tries to make water, when the stone will frequently follow the bougie, being forced from him by the *vis-a-tergo*. I have found this plan to be the most successful.

Operation to extract the calculus. — If the stone permanently lodges in the membranous portion of the urethra, pass a catheter down to it, and introduce a finger into the rectum, to press upon the canal behind the stone, so as to prevent any retrograde movement of it towards the bladder; then make an incision in perineo upon the calculus, and extract it with the common dressing forceps.

Stone behind the scrotum. — If the stone be placed in the urethra above the scrotum, try to press it

forwards with the fingers, until it be brought before the scrotum; if this cannot be effected, it must be pushed back behind the scrotum, and there cut upon, if the use of the large bougie, as in the former case, is not successful.

Scrotum must not be opened. — Do not cut through the scrotum to remove a calculus until all other means have been tried; and if it be at all necessary, which I doubt, let the external opening be free, so as to allow of a ready escape for the urine, and thereby prevent its extravasation into the cellular tissue, which would produce extensive inflammation and suppuration. A catheter should be introduced into the bladder after the operation, and left there, that the urine may flow through it during the time the wound is healing.

Stone near the glans. — If the stone be situated near the glans, the surgeon should try to press it through the meatus; but, if he cannot accomplish this, he should introduce a common probe, curved at its end, behind the stone, and draw it forwards.

Forceps cannot be introduced effectually, because they open in the urethra before the stone, but cannot be passed over it.

Meatus to be enlarged. — It is better to enlarge the meatus with a lancet, to free the passage of the stone, rather than risk the laceration of the parts from violence.

Preparations in the Museum at St Thomas's Hospital. — In the collection at St Thomas's Hospital I have two preparations, showing calculi which have ulcerated their way into the urethra. One, a stone of the form and size of the little finger, and slightly curved, which I cut from a young man who had a fistula in perineo: with a probe I felt the end of a calculus through the fistulous opening, and therefore made an incision and extracted it; its anterior extre-

mity was in the membranous portion of the urethra, its posterior in the bladder. In the other preparation, the stones are seen partly in the prostatic part of the urethra, passing there by ulceration. I have twice known a stone in the urethra destroy life by occasioning an extravasation of urine into the scrotum.

LECTURE XXIV.

OF CALCULI IN THE PROSTATE GLAND.

I SEPARATE these from urinary calculi, because they are formed independent of that secretion, and they differ generally in their component materials from urinary calculi.

Found in two situations. — I have found them in two situations in the prostate: 1st, several calculi, each seated in a separate small duct; 2dly, numerous calculi placed together in a cyst or bag in the substance of the gland.

Do not acquire a large size. — They rarely acquire any considerable size; the largest I have seen not being bigger than a pea, and they seldom are so large; but their numbers are sometimes very considerable.

Case. — I was called by Mr George Vaux, to see a Mr Lewis, in the Old Jewry, who had retention of urine, and in whom there was difficulty in passing the catheter. As the instrument entered the bladder through the prostate gland, it grated over a stone. I passed my finger per rectum, and felt two or three calculi grating against each other, and I endeavoured to persuade him to let me extract them, but he would not consent. He died of diseased kidneys, and I have his prostate gland, containing the calculi, in the collection at St Thomas's Hospital.

Case. — The second case was that of General B —, whom I cut for the stone in his bladder: I removed

many calculi, some of which were prostatic and some urinary. The surgeon, who had attended the General previously, had observed that a bougie, which he had introduced into the bladder, was marked by the calculi. The patient recovered.

Case. — I operated on a patient of Mr Forbes, surgeon at Camberwell, and removed an immense number of prostatic calculi. These calculi had produced not only painful feelings in the perineum, but a degree of irritation, which kept the patient in continued mental excitement, bordering upon insanity. I introduced a staff into the bladder through the urethra, and opened the perineum as far as the prostate, cutting into the urethra, as in the operation for lithotomy; I then made an incision into the left lateral lobe, and extracted many calculi from a bag formed in it. The patient bore the operation well, but did not perfectly recover; a fistulous opening remained, and his symptoms became as distressing as before. On examining by the fistulous opening, I could distinctly feel more calculi, although I could not discover them by introducing my finger per rectum. The sufferings of the patient induced me, about six months after the first operation, to perform a second, which I accomplished by passing a director into the fistulous opening, and then enlarging this opening by a bistoury: I extracted about half as many calculi as in the first operation. The patient soon recovered from the effects of this second operation, and the wound closed entirely; but, after a short time, his sufferings became as dreadful as before, and, believing that he could not procure any relief, he destroyed himself six months after the second operation.

The operation is not difficult, and is certainly not dangerous. If the calculi are in a single cyst, a single operation will produce complete relief; but if

more than one cavity exist, other operations will be required.

These calculi are composed of phosphate of lime.

OF CALCULUS IN THE FEMALE.

Operation seldom necessary. — Lithotomy is much less frequently required in the female than in the male, probably on account of the meatus readily permitting the escape of materials which would have become the nuclei of stones in the male, be they portions of gravel, of blood, inspissated mucus, or extraneous bodies.

Symptoms. — When the female labours under calculus, her sufferings are more severe even than those which the male experiences from this disease: at first the symptoms are of the same kind, as urgency to make water, and frequent inclination to do so; sudden stoppage to the flow of the urine; pain at the end of the urinary passage; and blood occasionally mixed with the urine. In addition to these symptoms, as the irritability of the bladder increases, the pain during micturition is excessive, and there is agonizing suffering after the discharge of the urine, from a bearing down of the bladder, uterus, and rectum, with a sensation of their being forced through the lower opening of the pelvis. The retention of urine becomes imperfect, and the person is always wet, and smells offensively of urine. The sufferings of the patient at length render her incapable of moving from her bed.

The calculus is usually lodged in the bladder, as in the male; but I have once seen a case in which the stone was placed half in the urethra and half in the vagina; the extremities of the stone were large, and connected by a narrow portion, which passed through an ulcerated opening in the under part of the urethra.

Unnatural propensities in women. — Women sometimes render themselves the subjects of lithotomy from perverse and unnatural propensities. I have known a female put a pebble into the meatus urinarius.

A lady in using a catheter for herself, broke it in the bladder, and I extracted it in the presence of Mr Ilott, of Bromley.

I have known women introduce extraneous substances into the vagina, to invite the operation for the stone.

Case. — A girl, about twenty years of age, came to St Thomas's Hospital, describing herself to suffer all the symptoms of the stone; she was placed upon the operating table, before all the students, and Mr Cline passed a sound to ascertain the presence of the stone; he struck some solid body, and a person of less caution might have immediately proceeded with the operation; but he said, 'I feel a solid body, which has not the hardness of stone;' he then examined by the vagina, and drew from thence a portion of coal, and afterwards several other pieces: she had no disease.

Case. — I cut a woman in Guy's Hospital for the stone, and found a large piece of a brass nail in her bladder, which is now in the collection at St Thomas's Hospital.

Stone formed on an extraneous body. — In the female, a stone will form around an extraneous body, as in the male, of which the following is a curious instance: — a woman was the subject of retention of urine, and required the frequent introduction of the catheter: she was under the care of Mr Castle, surgeon at Sittingbourne; and one of his assistants having passed the catheter, allowed it to escape from his fingers into the bladder, and there it remained for several months: she was then sent to Guy's Hos-

pital, where I sounded her and felt the catheter. I opened the urethra freely with a knife, and passing my finger into the bladder, found the catheter placed transversely in it, and on its centre a large calculus with each end free from such accumulation. I then brought down one end of the catheter to the meatus, with my finger, and thus removed it. The calculus deposit on the instrument weighed at least an ounce.

Large stones may pass the urethra. — Very large calculi can pass by the meatus. Mr Giraud gave one of more than an ounce weight, which a woman had passed with her urine.

Medical treatment. — The same medical treatment is proper in the female as has been recommended in the male, to lessen the patient's sufferings. It might be thought that solvents could with advantage be injected, but the patients cannot bear them, and will not submit to their use, as they irritate excessively. Opium may be injected, or a suppository be introduced; but they only relieve for a very short period.

Calculi extracted without cutting. — Stones of large size may be extracted from the female without the use of cutting instruments. Mr Thomas has related, in the Medico-Chirurgical Transactions, a case in which he dilated the meatus urinarius to extract an extraneous body from the bladder. Guided by this circumstance, I removed a calculus, having, by the use of sponge tent, dilated the meatus; and in another case, by the dilating forceps, I took away a portion of a catheter.

Case. — Dr Nuttall and myself attending a case together, he objected to my mode of dilating the meatus, and thought that forceps with blades opening in parallel instead of divergent lines would be better. We walked together to Mr Weiss, who,

with his usual ingenuity, made a forceps upon that principle.

Unless a stone be extremely large, it should be removed by dilatation of the urethra, which may, by a speculum or pair of forceps, be opened sufficiently in a few minutes for this purpose. The advantage attending this mode of extracting a stone is, that the passage again contracts, and the urine is afterwards retained.

In the first case in which I performed this operation in Guy's Hospital, having used sponge tent, the patient perfectly recovered in a very few days.

Mode of operating with the knife. — If the operation for lithotomy be required in the female, it should be performed in the following manner: — the patient having been bound in the same position as in the operation on the male; the sound is to be introduced (and it may be sometimes necessary to use a curved male sound, which Mr Cline used to recommend,) in order to detect the calculus.

The stone being found, a straight staff is to be introduced when the sound has been withdrawn; and this the surgeon should hold in his left hand; with the groove turned to the left branch of the ischium: the beak of the straight bistoury is then to be passed along its groove into the bladder, so as to divide the meatus and urethra obliquely downwards and outwards on the left side, between the vagina and branch of the ischium. The finger may then be passed into the bladder, to ascertain the situation of the stone, after which the forceps are to be introduced and the stone extracted. The curved forceps are sometimes necessary on account of the capacity of the bladder, and the usual position of the calculus, which rests behind the neck of the bladder, over the posterior and upper part of the vagina.

Large stones difficult to extract. — A large stone is

with difficulty extracted from the female, on account of the proximity of the meatus and pubes.

Operation causes incontinence. — In all cases of this operation which I have performed or witnessed, the urine has not been afterwards retained; but I would not deny that a patient might recover the retentive power.

As the loss of retention is a greater evil than I can describe, producing excoriation, and a very offensive state, I shall, in any future operation of lithotomy, try what may be effected by employing a suture to bring the divided parts together.

OF CALCULI IN THE SUBMAXILLARY DUCT.

Produce inconvenience. — Stones forming in this duct produce considerable inconvenience, and the cause of the symptoms generally exist for some time before it is discovered.

Case. — When I was living with Mr Cline, he used frequently to say, 'I have a spasm in my mylo-hyoideus muscle,' and it was usually at the time of eating that he made this observation: at length he said, 'I have discovered the cause of the uneasiness and spasm under my tongue, it arises from a stone in the submaxillary duct,' which he desired me to feel, and which I removed from him in the manner I shall presently describe.

Case. — A medical man called upon me and said, 'I have an irritation and swelling under my tongue; I have taken great quantities of blue pill; but as my health is becoming impaired, and the disease continues, I am advised to go to the coast.' On putting my finger under his tongue, I felt a calculus, which I immediately removed, and in a week he was well.

Situation. — These calculi are generally situated in

the trunk of the duct, but sometimes in its branches within the substance of the gland.

Size. — The largest I have seen was the size of an almond deprived of its shell; I have seen one fluted so as to allow of the passage of the saliva through the depression.

Composition. — They are composed of phosphate of lime.

Operation to extract them. — The operation for their removal is to be performed as follows: — the cheek is drawn back by means of a blunt hook introduced at the angle of the mouth; the duct is pressed upwards by the finger of an assistant, placed under the lower jaw: an incision is then made, with a pointed and curved bistoury, upon the stone from under the tongue, within the mouth, so as to divide the lining membrane of the mouth and open the submaxillary duct; the stone being exposed is to be brought from its situation by means of a small hook which is to be passed under it. If the stone be deep seated in the substance of the gland, a small pair of forceps are required to extract it.

LECTURE XXV.

OPERATIONS FOR RETENTION OF URINE.

It is not my intention, in the present Lecture, to enter into a detailed description of the causes which give rise to the retention of urine; but merely here to state them generally, and at a future time give a more particular account of each.

Causes. — The causes which I have known produce retention of urine in the male are:

1. A narrow orifice to the urethra.
2. A congenital obstruction in the urethra.
3. Permanent stricture.
4. Inflammatory stricture.
5. Spasmodic stricture.
6. Abscess or tumour pressing upon the urethra.
7. Stone in the urethra.
8. An enlargement of the prostate gland.
9. Paralysis of the bladder.
10. Chancres or other ulcers in the urethra, which in healing close it.

In the female:

1. Polypus of the vagina.
2. Polypus of the uterus.
3. Ovarian enlargement.
4. Retroversion of the uterus.
5. Loss of power from uterine affection, a species of hysteria.

Consequences. — From whatever cause the retention be produced, the bladder must be relieved of its load, or the patient will die from inflammation or gangrene, or perish from irritation.

An operation necessary. — If therefore a catheter

cannot be introduced; if relaxation by bleeding, the warm bath, and antimony; if lulling the patient by opium, do not succeed in giving a passage to the water, an operation will be required to save the patient.

Symptoms. — Besides the dreadful pain and excessive irritation occasioned by the distention of the bladder, retention of urine is marked by a frequent urgency to make water, and swelling of the lower part of the abdomen, from the accumulation in the bladder; this swelling reaches as high as the navel, and on each side to the lineæ semilunares: the fluid accumulation can be distinctly felt through the abdominal parietes.

Operation. — The mode of relief which has been usually resorted to has been to puncture the bladder; but, in the male, it is not the operation which I perform, nor do I recommend it as a general practice; but as it may be occasionally required, I shall describe the different modes of puncture.

Founded on anatomical knowledge. — The operations of puncturing the bladder are founded upon a knowledge of the reflexion of the peritoneum, which passes from the abdominal parietes above the pubes to the fundus of the bladder; and is continued to the back of the bladder, near to the prostate gland, and is then reflected to the fore part of the rectum.

Thus the cervix of the bladder and its fore part above and behind the pubes, also the posterior and inferior part behind the prostate gland as far as the entrance of the ureters, are devoid of peritoneal covering.

OF THE PUNCTURE ABOVE THE PUBES.

When the bladder becomes excessively distended, its fundus rises towards the umbilicus, and carries with it the peritoneum, so that a considerable space

is left above the pubes uncovered by this membrane, at which place a trocar may be easily introduced, without danger of wounding it.

This space is covered by the linea alba, in the centre, and at the sides by the pyramidales and recti muscles, the bladder being attached beneath by cellular tissue.

Operation. — The operation requires the following attentions.

1st, The patient is to be placed on a table, in the horizontal position, with his knees a little elevated.

2dly, The hair is to be removed from the pubes.

3dly, An incision, one inch in length, is to be made through the integument immediately above the pubes, in the direction of the linea alba.

4thly, A trocar and canula, of sufficient length, are passed through the opening in the skin, and then thrust through the linea alba, cellular tissue, and fore part of the bladder into its cavity.

5thly, The direction of the trocar should be to the basis of the sacrum, that is, a little upwards, and not directly downwards in a perpendicular line, as it may then pass between the bladder and pubes; and even if the instrument enters the bladder, as the organ contracts it slips from the canula.

6thly, The trocar is to be withdrawn to allow the urine to escape through the canula.

7thly, A male flexible catheter is to be passed through the canula, cut to a proper length, so as to remain in the bladder, and it is to be secured so as to prevent its escape.

This operation is easy of performance, requiring little anatomical knowledge, and has therefore usually had the preference given to it.

After-treatment. — When the inflammation following the operation has subsided, when all danger from extravasation of urine into the cellular membrane

has ceased, and the patient recovers his health, it is right to begin attempts to re-establish the urethra by the use of bougies, sounds, &c, and this may be generally effected.

Case. — I saw a man from Essex, below Malden, whose bladder had been successfully punctured by Dr Hare, above the pubes, twelve months before, and who came to town to consult me, with a female catheter still remaining in the bladder, in the same opening at which the urine had been drawn off. I, after a time, succeeded in passing a catheter into his bladder through the urethra, the female catheter was removed, and he returned into the country with the wound above the pubes quite closed.

Objection to the operation. — An objection to this operation, formerly urged, was, that the canula remaining in the bladder produced irritation: this is obviated by the use of an elastic gum catheter, instead of the metallic one.

OF PUNCTURING THE BLADDER BY THE RECTUM.

Bladder forms a projection into the rectum. — When the bladder is greatly distended, and has not undergone any morbid change, it generally projects into the rectum; so that if the finger be introduced into the gut, a fluctuating swelling is felt just beyond the seat of the prostate gland.

When the prostate gland is enlarged, this part of the bladder is more remote from the anus and less accessible, although still within reach.

Part to be punctured. — Behind the prostate gland is a triangular space, bounded in the following manner: — on each side by the vasa deferentia and vesiculæ seminales meeting at the prostate; and the peritoneum is the boundary behind. In the centre of this space a trocar and canula may be passed

through the fore part of the rectum, through the cellular tissue connecting it to the bladder, and through the coats of the latter into its cavity.

If the centre of the space be kept, there is no danger of wounding the vasa deferentia or vesiculæ seminales if the bladder be distended. The trocar may be safely introduced an inch behind the prostate without risk of injuring the peritoneum, and the vasa deferentia may be thus completely avoided, whereas a puncture near the gland might endanger them.

Operation. — The operation is to be thus performed:

1st, The patient is to be placed on a high table, so that the surgeon can sit lower than the patient.

2dly, The finger is to be passed per rectum to the projecting portion of the bladder behind the prostate.

3dly, A trocar and canula, three inches long, are to be passed upon the finger to the protruding part of the bladder, and forced through the fore part of the rectum and posterior part of the bladder into its cavity. A curved trocar has been advised and employed, but it is quite unnecessary if the silver canula be not suffered to remain.

4thly, The trocar is to be withdrawn, and a flexible gum catheter is to be passed through the canula into the bladder; the canula is then to be removed, and the elastic catheter is to be confined to a T bandage, or to a tape passed between the thighs.

After-treatment. — When the patient has sufficiently recovered from the inflammation which the disease and operation have produced, it will be right to begin with re-establishing the urethra.

This operation is easily performed; but it is decidedly objectionable, on account of the urine

being liable to produce a diseased state of the rectum.

Dr Cheston, of Gloucester, told me that he had seen great disease of the intestine occasioned by it.

I was sent for to a patient who had undergone this operation for a retention of urine from a disease of the prostate gland. The bladder had been punctured just before my arrival, yet I easily passed a catheter into his bladder through the urethra. I mention this to show how little the operation was required, and that the enlarged gland did not prevent the introduction of the catheter.

OF THE OPERATION IN PERINEO.

The neck of the bladder around the prostate gland is devoid of peritoneum; and, excepting the posterior surface, where the vasa deferentia and vesiculæ seminales are seated, there is no important part which can be injured by a puncture.

Requires anatomical knowledge. — This operation requires more anatomical knowledge than the two which I have described; it is more difficult to perform, and much more care is required to preserve the opening into the bladder; yet, to a scientific surgeon, even this presents but little difficulty. Mr Cline used always to advocate its performance.

Operation. — The steps of the operation are as follow:

1st, An incision is to be made in perineo, as in the operation for the stone, and it is to be carried to the bulb of the urethra, where it is covered by the accelerator urinæ.

2dly, The bulb is to be pressed by the finger to the patient's right side, and the incision is then carried onwards between the bulb and left crus of the penis, as far as the prostate gland.

3dly, The surgeon is to pass his finger into the wound as far as the left side of the prostate gland, so that it may serve as a guide to the canula and trocar.

4thly, The trocar and canula are to be pushed into the cavity of the bladder, by the left side of the gland.

5thly, The trocar being withdrawn, the canula is left in the bladder to allow of the escape of the urine.

6thly, Through the canula an elastic gum catheter is to be passed and secured, as in the former case.

Subsequent treatment.— When the patient has recovered sufficiently, the natural canal is to be opened by the use of a sound or bougie; and in all cases of considerable difficulty, when the urine passes freely by the artificial opening, a caustic may be safely employed.

Other modes of relief. — Having described the different operations which are performed for the relief of a patient having retention of urine, I shall now proceed to point out the practice which I have myself pursued in these cases.

Most frequent causes of retention. — I must premise, that I consider, from the experience I have had in this disease, that nine tenths of the difficulties in passing the urine arises from strictures of the urethra, or from enlargement of the prostate gland: with respect to the latter, I have never yet seen a case in which I could not pass a catheter, made of proper form and size, although I do not wish to be understood to say, that there never can be such a case; but only, that in the course of a very extended experience I have never found an instance of it. I shall say more upon this subject when I speak of the diseases of the prostate gland; but shall now

return to describe the mode of relieving retention from diseases of the urethra.

Preferable operation. — The operation which I prefer is, to open the urethra only, and not to puncture the bladder, which I hold, in the male, to be scarcely ever necessary.

Case. — One night, when giving the surgical lecture at St Thomas's Hospital, a dresser of Mr Chandler's, then surgeon to the Hospital, came into the Theatre to inform me that a patient was labouring under retention of urine from the use of a caustic bougie; that the man was in great pain, and that a catheter could not be made to pass the stricture. I said, 'I will go with you into the ward after lecture, and do what is necessary.' The pupils accompanied me. Upon examination of the man, I found that the stricture was seated in that portion of the urethra which was covered by the scrotum. I tried to pass different instruments, but could not succeed.

Reflecting upon the case, it appeared to me to be exposing the patient to unnecessary pain and danger if I punctured his distended bladder; as, when I directed him to make attempts to discharge his urine, the urethra swelled excessively behind the stricture, from the urine passing as far as its seat. I therefore determined to make an incision into the urethra only, which I immediately did, being directed to the place by the distention which an attempt to void the urine produced. The urethra was opened behind the scrotum, and the urine readily discharged. The patient rapidly recovered without any bad symptom.

I was also induced to act as I have described, by the following case. I was sent for early one morning to visit a patient with retention of urine, who had a cicatrix at the extremity of the urethra, from

a chancre; for some time the urine had passed in a great degree by drops; and when in a stream, in one not larger than a hair. When I saw him, the urgency to make water was excessive, but not a drop would pass, yet I found that it distended the urethra as far as opposite to the situation of the frænum. I therefore immediately passed a lancet through the cicatrix in the usual seat of the meatus, and so soon as I penetrated the glans the urine rushed by the sides of the lancet.

Case. — Mr Robert Pugh, of Gracechurch Street, sent to me to visit a patient of his who had a retention of urine from stricture in the urethra, which no instrument would pass. Upon directing him to try to micturate, the urethra could be felt to swell behind the stricture, and I passed a lancet into it behind the obstruction. The urine directly flowed through the opening.

I now never open the bladder, but merely do as I have above described; and I am happy to say, that some of my surgical friends, at our Hospitals, have repeatedly adopted the same plan, and successfully.

I sometimes introduce a female catheter into the urethra through the wound, to prevent extravasation and to permit the easy passage of the urine, but this is not absolutely necessary.

Objections to the operation. — This operation has been objected to, on the supposition that it requires great anatomical knowledge, and is very difficult to perform: — to the first objection I will say, that he who is adverse to an operation because it requires anatomical knowledge, should immediately give up his profession; for if surgery be not founded upon an accurate knowledge of anatomy, it will be better for mankind that there should be no surgery, as disease will proceed better with the natural means of

relief, than with the aid of those surgeons who are not anatomists.

Difficulty obviated. — With respect to the difficulty of the operation, I would say to him who finds any, pass a catheter or staff to the stricture, and, directed by its point in making the incision, carry it an inch behind, and in a line with the point of such director, and the difficulty will vanish.

The state of the urethra in stricture is very different to that which exists with fistula in perinèo: in the former case it is large behind the obstruction, in the latter it is contracted and very difficult to find.

Little danger in this operation. — By the mode I have advised, the danger of retention of urine is almost entirely dissipated, for opening of the urethra will be rarely followed by fatal effects.

OF RETENTION OF URINE IN THE FEMALE.

Puncture rarely necessary. — The puncture of the bladder is rarely required in the female; and when it becomes necessary, the surgeon can hardly hesitate in his choice of the mode he shall adopt.

Different modes. — It might be performed through the vagina, or it might be executed by the side of the meatus between it and the branch of the pubes in some cases; but the former would probably cause a fistulous orifice, by which the urine would constantly irritate the vagina, and the latter would for some causes of retention be impracticable.

Above the pubes the best. — The operation above the pubes appears to be, in all respects, preferable to any other; the steps of it are the same as those in the male, and therefore there is no necessity for my again describing it.

OF AMPUTATION OF THE PENIS.

When necessary. — This operation is occasionally required for a cancerous state of the part.

Disease commences in the prepuce. — The disease, which renders the operation necessary, commences sometimes upon the prepuce and sometimes upon the glans.

When seated upon the prepuce, it begins on a pimple, surrounded by a hard base; it ulcerates slowly and discharges a bloody serum, occasionally with a mixture of pus. At first, slight irritation only attends it; and, after a time, the patient experiences sharp darting pains. As the disease extends, a large portion of the prepuce participates in it; and if it be long suffered to proceed, a gland in one or both groins becomes affected. A phymosis is gradually produced, and a division of the skin must be made, to ascertain the exact nature and extent of the disease; and if the complaint be decidedly cancerous, it will be best to complete the operation at once, by cutting away the whole of the affected prepuce by a circular incision, and then securing the divided vessels. When the bleeding has ceased, a poultice should be applied, with which the wound heals better than by any other dressing.

Commencing in the glans. — 2dly, When the disease begins upon the glans penis, it usually makes its appearance in the form of a wart, attended with considerable irritation, and a discharge of serous fluid. The wart ulcerates, and the surrounding parts acquire a great degree of hardness and swelling. Other warts, of a similar nature, are produced, so that the ulcers become numerous: they also extend deeply, and phymosis is occasioned by the surrounding tumefaction. Great impediment arises

to the passage of the urine, but at length apertures form from the urethra through the skin of the penis: the patient suffers from irritation of the raw surfaces by the urine, and the disease is accompanied with those lancinating and shooting pains, which usually attend cancerous affections.

If the prepuce be slit up, the whole glans is found swollen, and excessively hard; and the penis, from the number of its warty excrescences, and from their eversion, has somewhat the resemblance in its appearance to the cauliflower.

State of the corpus spongiosum.—The corpus spongiosum and the urethra are diseased nearer to the pubis than the glans, and the surgeon must examine with care the extent of the complaint in that direction.

Hæmorrhage.—Free hæmorrhage from the ulcerated surfaces occasionally occurs, the glands in the groin become enlarged, and sometimes several in each groin; and when this happens all hope from surgery has vanished. The glands sometimes ulcerate and produce a very troublesome sore, with everted edges and irregular surface, a serous discharge, and sometimes free hæmorrhages.

Destruction of the penis.—The penis continues ulcerating until that part which is naturally pendulous becomes destroyed, occasioning retention of urine, and great difficulty in its discharge at other times. The urine passing in various directions excoriates the scrotum, and leads to a most painful but lingering termination of existence.

Frequent cause.—This disease is often the result of a natural phymosis, leading to a confined and irritating state of the secretions of the glandulæ odoriferæ; and, when the constitution becomes unhealthy, to the production of unnatural actions in the part.

Medicine of no service. — As to the treatment of this disease, nothing is to be done by medicine or applications, but to tranquillize the parts and to keep them clean.

Irritating applications prejudicial. — All irritating applications should be avoided. Poultices, ointments of bismuth, lead, chalk, opium, zinc, may be alternately employed, as that previously used loses its effect.

Arsenic. — Arsenic I have tried in these cases, but have never succeeded with it; on the contrary, it has greatly irritated and made the sore more extensive and the warts more numerous.

Removal. — The only means by which the effects of this dreadful malady can be averted, consist in the early removal of the diseased portions of the penis.

It is required, in doing this, that the surgeon proceed somewhat beyond the exact limits of the disease; more especially must he examine with care the urethra and corpus spongiosum, in which the complaint is usually most extensive.

The operation is dreadfully painful, but it lasts only for a moment.

Operation. — Its steps are as follow:

1st, Draw forward and elongate the penis as much as is possible.

2dly, Tie a piece of narrow tape tightly around the penis at the pubes.

3dly, Make a direct cut through the penis, behind the disease, without any attention to preserving the integuments to cover the corpora cavernosa and corpus spongiosum; for to do so is a great evil, by preventing a free escape of the urine.

After-treatment. — 4thly, Tie a tape tightly around the remaining part of the penis, and make pressure upon it, and there is no necessity for securing any blood vessel.

When the bleeding has stopped, remove the tape and apply lint upon the wound.

In a few hours, the necessity of micturating will remove the dressings; and when the danger of bleeding has ceased, a poultice should be applied as the best means of exciting granulation and of healing the sore.

Introduction of bougie. — When the surface begins to granulate, a piece of bougie, two inches long, is to be worn constantly in the urethra, to prevent its contraction, otherwise it gradually closes as the wound heals, and produces retention of urine.

LECTURE XXVI.

OF FISTULA IN ANO.

Definition. — This is an abscess of the cellular membrane, near to the rectum, which produces an aperture into the rectum, or by the side of the anus.

Difficult to heal. — If it be asked why this abscess is so much more difficult to heal than others, and why it frequently requires an operation; the answer is, that from its vicinity to the rectum, it is influenced by the action of the sphincter and levator ani; and that these muscles have a constant tendency to prevent the union of the granulations and coalescence of the sinus. It therefore rarely happens, but that the surgeon is required to assist nature in the restoration of the parts to a healthy state, by dividing the sphincter, and thus destroying its influence upon the sinus.

Symptoms. — The symptoms of this disease are, pain near the anus, with considerable hardness, bearing down, and tenesmus upon going to stool, and difficulty in the evacuation; throbbing and darting pain in the rectum, and on the diseased side of the nates. A fluctuation is perceived; and if the case be left to nature, the abscess breaks either into the rectum, and the matter and blood are discharged with the fæces, or it breaks externally near the anus, but sometimes at a distance from it, either in the perineum or in the nates. The matter which issues from the abscess is sometimes excessively putrid, ex-

tricating a considerable quantity of air, and is highly offensive.

Discharge of the matter. — The fistulous orifice, when it is formed into the rectum only, is the most difficult of management, because the orifice is with difficulty discerned. When the abscess breaks both externally and into the rectum, it is most easy of treatment; but it generally discharges itself only externally; and a probe, when introduced, passes to the side of the rectum, sometimes to the external surface of the intestine, at others from half an inch to an inch from it, so that the original seat of the matter is in the cellular tissue surrounding the rectum.

Extensive sinus. — I have several times known a sinus form on each side of the anus, and communicate around the rectum, of which we have a preparation in the collection of St Thomas's Hospital, so that the rectum has been considerably separated from the surrounding parts. I examined a man who died of a discharge from a sinus in the groin, and who had a fistula in ano; and upon tracing the sinus in the groin, it passed under Poupart's ligament and took the course of the vas deferens, and descended into the fistula in ano.

Small sinus. — Sometimes the sinus only just reaches the sphincter, and is extremely small, at first appearing only as a suppuration of one of the follicles of the anus. Sometimes the matter burrows four inches by the side of the rectum.

Caused by a pile. — The abscess has, in some instances, its origin in a suppurating pile.

Origin sometimes local. — Fistula in ano is, in a few instances, a local disease, depending upon a change in the part itself; but is much more frequently the result of distant visceral complaints, and of a broken state of the constitution.

How produced. — When confined to the part, it arises from obstinate costiveness and the efforts to discharge the fæces; and the passage of an indurated stool produces inflammation of the muscles and cellular tissue of the rectum. But the opposite state to the above I have several times known produce it; thus, in a severe diarrhœa, which determining large quantities of blood to the rectum, and being accompanied with tenesmus, is followed by inflammation and suppuration at the extremity of the rectum.

But the more common cause is disease of the liver, which, preventing the free return of blood from the intestines, leads to inflammation at the ar - and by influencing the secretions for the intestines, occasions a similar effect.

Diseased states of the lungs are also frequently giving rise to it; from the impediments they produce to the free return of blood, local venous congestion is produced: piles are a common effect, and abscesses at the anus frequently follow.

Connected with phthisis. — Often, therefore, before a person perishes from phthisis, he has a fistula in ano; and this is the reason fistula is considered as a dangerous disease; although in reality it is not so, but it is the consequence of more important diseases, which destroy life.

The surgeon often brings discredit upon himself by operating in these cases in the last stage of phthisis, when no operation ought to be performed, and when it is impossible the disease can be cured; therefore that death, which is the result of pulmonary disease, is falsely attributed to the fistula in ano.

Treatment medical. — The medical treatment of this disease consists in restoring the secretions of the liver and intestinal tube, by submurias hydrargyri, or pil: hyd: at night, and infus: gentianæ compositum, with

soda and rhubarb, twice in the day; and if there be any pulmonary or pectoral disease, its treatment must precede, and its cure be performed, before any active local means of treatment be had recourse to. The strength of the patient must also be restored before any operation be performed, or the wound will not heal favourably.

Local. — If a patient applies with a tumour near the anus, threatening the production of an abscess, and the general health be tolerably good, its treatment is to be as follows: — apply leeches to the part, and let a lotion of the acetate of lead be constantly kept upon the surface. Give to the patient the confectio sennæ with sulphur, as the most gentle aperient; all drastic medicines exert too much action of the muscles of the rectum, and determine blood to the anus, so as to add to the irritation and increase the disposition to suppuration.

To be opened early. — If the swelling increase and become more painful, apply fomentation and poultice to the part. When a fluctuation can be perceived, put a lancet into the swelling, as an early opening prevents a large collection of matter, and I have known the wound immediately close and no fresh accumulation follow.

If it break by natural efforts, it is best to suffer it to discharge and to fill by granulating, to make the sinus as small as possible before any operation be performed.

The sinus very rarely heals entirely by natural processes, because, so soon as its sides adhere, they are pulled asunder by the action of the sphincter ani, and union is thus constantly prevented.

Four states of fistula. — There are four variations of the fistula, as regards the operation.

Operation for the first. — The first is that in which the abscess breaks into the rectum and near to the

anus; and the operation consists in the following steps: introduce a probe into the sinus, by the side of the anus, and carry it into the rectum, so as clearly to ascertain the course of the sinus, and to learn if any part of it extends above the opening into the rectum. Then introduce the director, and pass the probe-pointed bistoury of Mr Pott through the sinus into the rectum. The finger covered with oil is next to be introduced into the intestine, and is to be placed upon the extremity of the probe-pointed bistoury; then, if the sinus be of considerable length, the finger and knife are brought out together, so that the knife cuts the intestine and sphincter as it is withdrawn. If any portion of the sinus remain above the opening into the rectum, it should be divided with the probe-pointed scissors; one blade of which is passed into the extremity of the sinus, and the other into the rectum, and then, by shutting them, the sinus is divided. If the opening into the intestine be situated only a short distance from the anus, the end of the bistoury, may be first brought out at the anus and the operation completed by pushing the knife forwards.

Second state. — The second state of the sinus is that in which the opening is only at the anus; and when the probe is passed into it, it is felt at the extremity of the sinus, at some distance from the rectum.

Operation. — In this case, what I do is this: I pass the probe-pointed bistoury to the extremity of the sinus and my finger into the rectum. I then, with the extremity of the finger and the finger-nail, move the rectum upon the blade of the knife near its probed extremity, and sometimes move the knife a little at the same time. Thus I easily make the knife divide the intermediate parts, and then bring its probed point into the rectum, when the operation is

concluded as in the first case. I have known, in this instance, the division made by the sharp-pointed curved bistoury; but the objection to it is, that its point rarely takes the course of the sinus: then a portion is left undivided.

Savigny, an ingenious instrument maker, made a double bistoury, with a pointed and a probed knife: the one sliding by the side of the other. When it was introduced the sharp-pointed bistoury was thrust forward, and then retracted, and the probed bistoury succeeded it; but the objection to this instrument was, that it was too large for its easy introduction into the sinus, and it is really quite unnecessary.

Third state. — The third state is, that where the sinus enters the rectum, and has no external opening. It is required, if the orifice cannot be felt by introducing the finger into the rectum, to wait until an accidental inflammation leads to the capacity of feeling a swelling externally, when a lancet should be put into it from the side of the anus. A probe being introduced, it passes into the suppurating cavity communicating with the rectum.

Operation. — In this case it will be proper to perform the operation which has been described for the first state of fistula when there is an opening externally, and within the rectum.

Fourth state. — The fourth and last state is, that in which the sinus or sinuses extend from the anus into the nates.

Operation. — The practice I pursue is, then to divide the opening in the nates through the external skin, but leave that near the anus at first undivided, and when I have healed this part, then operate upon the other in the same manner as in the second kind of fistula.

OF TREATMENT AFTER THE OPERATION.

Local. — When the fistula has been divided, put dry lint into the wound, and compress the part until all bleeding has stopped. On the following morning apply a poultice, and in two or three days the lint will separate. Then pass a probe into the wound often, to prevent the union of the sides of the sinus for five or six days from the operation, and continue to poultice; but after this time, when granulations arise, it is right to introduce lint into the wound, and prevent their inosculation, until the wound, gradually granulating every where, the cavity becomes filled. If lint be introduced into the wound on the second, or third, or following days from the operation, great pain is given, and much inflammation is excited, so that there is danger of fresh suppuration: wait, therefore, until the inflammation has ceased, and then introduce but a small quantity of lint, and with great gentleness.

Constitutional. —If the sore be very indolent, occasionally purge the patient, and give him the confectio piperis, which produces very healthy granulations, and apply to the wound lint dipped in a solution of the sulphate of copper, or spread with the unguentum hydrargyri nitrico oxydi.

OF INJECTIONS FOR FISTULA.

Of the cure by injection. — Although, as it will be readily believed, I have seen a multitude of cases of fistulæ, I have only known two cured by injection, which were as follow.

I was attending, with Mr Pugh, surgeon, of Gracechurch Street, a lady, in Fenchurch Street, who had a fistula on each side of the anus. I opened one fistula, and cured it; but the patient would

not submit to the operation upon the other. Mr Pugh and I therefore agreed that we would try other means, and we injected into the sinus with oxymurias hydrargyri, the liquor calcis gr. 1. ad ʒj. and the sinus healed.

Case. — The second case was a gentleman from the North, a friend of Lord Harewood, who had been under the care of Mr Hey, of Leeds, for a fistula on the right side of the anus, and who came to me for advice. The fistula was of great depth and distance from the rectum upon the opposite side. I feared opening it, both from the delicate health of the patient, and the danger of hæmorrhage; and therefore threw into the sinus equal parts of port wine and water. My nephew, Mr Bransby Cooper, finding it did not bring on sufficient inflammation, injected port wine, undiluted, and thereupon inflammation followed; adhesion was produced, and the case terminated without further alteration.

OF SETON FOR FISTULA.

Of the cure by seton. — Timid persons prefer this mode of treatment to the knife, although in the one case the irritation is long continued, and in the other the pain is only of a few minutes continuance.

That it succeeds, in some instances, I have known; for some of my patients, having submitted to this remedy, returned to me well.

My objection to it is, that the irritation it produces is liable to occasion other abscesses, whilst healing that for which it is employed.

OF PILES OR HÆMORRHOIDS.

Two states. — These are found in two states, viz, a varicose enlargement of a vein; or an excrescence arising from its adhesion and organization.

The first is external or internal.

Of the external. — The symptoms of the first are an external swelling, which feels round and hard, which is painful at the passage of the stools: is hot and itches at other times. It sometimes bursts, and discharges blood with the stools. In a few days it declines and disappears. Sometimes it becomes inflamed, and very acutely painful; and it now and then suppurates, and lays the foundation of fistula. If cut into before suppuration, a large and very solid clot of blood passes from it.

Repeated returns of this complaint engender an excrescence, which arises from the swelling having undergone adhesion, and becoming organized, forming a cutaneous tumour which is very vascular. The skin over it is thin, — the substance very irritable, and pains shoot from it into the rectum to a considerable height from the anus. I have known a person confined to her bed from the excoriation and suffering produced by such excrescences originating in external piles.

Internal. — The internal piles are originally enlarged veins: they produce pain about the sacrum, bleed frequently, and render the passage of the motions difficult; and the stools are often mixed with blood.

At length many of these become obliterated by adhesion, and form very vascular pendulous tumours in the entrance of the rectum.

Occasion prolapsus ani. — They often occasion prolapsus ani; the patient feels as if there was more motion to discharge, and he forces the rectum until a part of it becomes everted, and the internal piles appear externally, thus producing prolapsus ani. The patient, after each evacuation, is obliged to return these with the finger; the evacuation is in consequence highly painful, tedious, and very often the return of the part is exceedingly difficult.

Profuse hæmorrhage. — The bleeding from the piles thus everted is often so profuse, that the weight of the blood exceeds that of the fæces. They sometimes vent a considerable serous discharge. When the number and size of the piles, and the degree of prolapsus becomes great, and there is much difficulty in their return, inflammation sometimes arises in them, and their return is rendered impracticable, without giving an unjustifiable degree of pain. When in this state, in addition to other sufferings, the urine is retained, the fæces pass with extreme difficulty, and there is a free sanious discharge from the part. When thus inflammation is the result of a strangulation of the piles from the pressure of the anus, it is immediately relieved by the return of the parts; but often the inflammation precedes the descent, and then the parts are too tender to be returned. It now and then happens that by this process nature effects a spontaneous cure of the disease; the parts proceed to gangrene, and a slough of the piles is produced, the rectum ceases to prolapse, and at least for a great length of time the patient is rid of his complaint.

Causes, sedentary habits. — The usual cause of piles is a sedentary habit, which leads to congestion of blood in the vessels of the rectum.

Diseased liver. — A diseased state of the liver is also a cause, by preventing a free return of blood.

Obesity. — Obesity occasions them, by the pressure of the omentum and mesentery upon the mesenteric veins.

Pectoral disease. — They, like fistula in ano, frequently arise from pectoral complaints, which affect respiration and the freedom of circulation.

Of the external. — If a patient applies with an external pile, open his bowels freely with confectio sennæ and sulphur. Apply leeches to the parts, and a lotion of acetate of lead. If, when the inflammation be subdued, the vein remains enlarged and hardened, puncture it with a lancet, and discharge a large and very firm clot of blood which it contains.

If it suppurate, fomentation and poultice will be the best applications: and when it bursts, if it shows no tendency to heal, it must be opened into the rectum.

Removing excrescences. — The excrescences left by external piles are growths only of the skin, and they may be freely removed when they become troublesome. Subdue the inflammation first, with evaporating lotions, and then remove them by scissors, or by the knife. The former is by far the most painful mode to the patient, but most easily performed by the surgeon.

Do not bleed. — These excrescences furnish no bleeding of any consequence.

Mode of removal. — I generally pass a tenaculum through them, draw them towards me, and cut them off with a lancet.

Treatment of internal piles. — The treatment of internal piles is more difficult, and requires attention to a number of circumstances.

Medical. — First. The medical treatment demands the exhibition of confectio sennæ cum sulphure; the bals: copaibæ is also a good medicine. If there be hepatic congestion, gentle doses of blue pill should be given, to restore the biliary secretions; in general, however, mercury disagrees in piles: Ward's paste, or confectio piperis of the London Pharmaco-

pœia, is an admirable remedy, opening the bowels gently and contracting the dilated vessels; soda and rhubarb I have known useful. If piles arise, as they sometimes do, from diarrhœa, the confectio opiata is the best medicine.

Local. — The local treatment, to prevent their increase, is to inject cold water into the rectum twice per diem; a dilute aluminous injection is also useful combined with decoction of oak bark.

Diet. — The diet must be attended to; animal food is better than vegetable, as occupying less bulk to afford the same degree of sustenance, and consequently presses less upon the returning blood vessels. Mutton is the best butcher's meat. White fish is easy of digestion. All flatulent food should be avoided. A good deal of exercise should be taken; and I have seen, in the incipient state of this disease, horse exercise of great benefit.

Hæmorrhage. — When the piles bleed, the medicine should be infusum rosæ cum magnesiæ sulphate; cold water should be still injected.

Prolapsus. — If prolapsus be produced, it should be washed with a solution of alum and oak bark, and it should be returned by a piece of linen dipped in oil, or covered by ceratum cetacei.

Inflammation. — When the piles are inflamed and a prolapsus is produced, purge the patient once freely; apply leeches; foment and poultice the part, and give opium as soon as the purgative medicine has operated. For two or three days let the bowels be quiet: the leeches, fomentations, and poultices being continued, then purge again; for daily purging adds to the inflammation and irritation.

I have known the application of cold water to the prolapsus useful, also the acetate of lead lotion, and the lotion mixed in a poultice, agrees best upon the whole; although the warmer applications are the most congenial with the patients' feelings.

Puncture. — Spontaneous bleedings from the piles greatly relieve them; and I have therefore sometimes punctured them with a lancet, with a view to the relief of the congestion of the vessels.

However, all the means which can be employed will not always prevent their increase; nor when they are once suffered to acquire considerable magnitude, and to produce prolapsus ani, can they be subdued by any medical or local treatment short of operation.

Mode of examination. — To examine a patient properly under these circumstances, and to enable you to form a correct judgment of the necessity for, and the mode of, operating, it is necessary that the patient should have an evacuation; and that, before the return of the prolapsus, the surgeon should examine the part.

He will then observe a portion of the rectum, forming the outer circle, and a number of round and dark-coloured projections, occupying the more central parts of the protruded mass. The operation is then ascertained to be necessary or not, according to the degree of prolapsus and the number and size of the piles.

Having determined that an operation is required, it is next to be considered in what manner it is to be performed.

Two modes of operation. — It may be done by excision, or by ligature, or it may be effected by a combination of the two.

Excision. — For excision, in the early part of my surgical career, I was a strong advocate; for I found it a less painful operation than ligature, and it appeared to me not dangerous; but as my experience increased, I was induced to change my opinion, and to consider excision as not divested of danger.

The three following cases are proofs of this: the

first, dying of inflammation; and the second and third from hæmorrhage. I have also seen, in a fourth case, extensive suppuration produced by excision.

Case. — Mrs O——, the wife of a respectable medical man, came to London to have some hæmorrhoids removed; and I advised their excision, observing, that her constitution was of a feeble and irritable kind. I removed only one of three which appeared. In three days after the excision by scissors, I found her complaining of great pain in her abdomen, from intestinal and peritoneal inflammation: she frequently vomited, and her abdomen became tense. The symptoms were not relieved, although motions were procured, and she died in a week from the operation. The internal surface of the intestine, and the peritoneum, were inflamed extensively.

Case. — Mr Esdaile came to London from Guernsey or Jersey, in order to have a hæmorrhoid removed. Mr Leman and I attended him, and I removed a single pile by scissors. On the following day he was exceedingly low, his pulse small, so as to be scarcely perceptible. On the next he voided a great quantity of blood from his intestines; and on the day after he died, falling a victim to internal bleeding, from the return of the divided vessel with the prolapsed intestine.

Case. — The Earl of S—— applied to me for piles with prolapsus ani, and I removed some of the largest with scissors; the prolapsus was greatly relieved; and for more than twelve months after he was little troubled, either with hæmorrhoids or prolapsus. About two years afterwards he again applied to me, for a return of his complaint; and seeing his age, and having examined the piles, I thought before I operated, I would have a consulta-

tion, when the operation of excision was again recommended. I removed with the scissors one of the largest, and desired his lordship to keep the recumbent posture. He laid down upon the bed immediately after the pile was removed. In about ten minutes he said 'I must relieve my bowels,' and he rose from his bed and discharged into the close stool what he thought to be fæces, but which proved to be blood. In twenty minutes he had the same sensation, and evacuated more blood than before, in about the same lapse of time: he again rose, and soon became very faint from the free hæmorrhage. I, therefore, opened the rectum with a speculum, and saw an artery throwing out its blood with freedom, I therefore requested him to force down the intestine as much as he could, and raising the orifice of the bleeding vessel with a tenaculum, secured it in a ligature, and also compressed the artery with a piece of sponge. His lordship bled no more. On the following day he was low, his pulse very quick, and he had a shivering: on the next he complained of pain in his abdomen; he had sickness, and tenderness upon pressure, and in four days he died. In the presence of Mr Wardrop I opened his body, and found inflammation of the rectum, and disease of the glandulæ solitariæ of the intestine, they being enlarged and hardened, so that the intestine internally had a curious spotted appearance. He was not, therefore, a healthy or sound man in other respects; and it is in such cases that unexpected symptoms arise after operation.

Ligature. — As a ligature prevents the danger of bleeding, it is best to use it, although the process is more tedious and painful. The pain which it produces may be mitigated by not drawing the ligature too tight. Draw down the pile with forceps, or a tenaculum, and tie a piece of waxed silk around it,

draw the knot until the patient complains severely, then tie a second, cut off the ligature a little way from the knot, and return the intestine and pile.

Double ligature. — But in cases in which the pile is very large, a safer and less painful plan may be adopted; namely, to pass a needle and ligature through them, and to cut them off beyond it.

Operation. — The mode of operating for these large hæmorrhoids is as follows: Draw down the pile, pass a needle, with a double ligature, through its juncture with the intestine. Cut off the needle, and the two ligatures will remain on the pile; then tie one above, and the other below, and thus the whole pile is included; then cut off the pile with a lancet or scissors beyond the ligature, and in the evening or on the following day, the threads may be removed, as all danger of bleeding has ceased.

By this operation hæmorrhage is prevented, and the pain is exceedingly diminished, as the ligature does not require to be made very tight.

The prolapsus ani generally soon ceases after the complete removal of the piles; but if it does not, cold and astringent injections should be employed, and the confectio piperis be given.

LECTURE XXVII.

OF POLYPUS OF THE NOSE.

Four kinds. — Polypi of the nose are of four kinds: 1st, The common pendulous polypus; 2d, The hydated polypus; 3d, The cancerous; 4th, The fungoid.

OF THE COMMON PENDULOUS POLYPUS.

Symptoms. — This disease is marked in its commencement by an occasional obstruction in the nose, as if from catarrh; the obstruction being increased in foggy and damp weather, and being greater early in the morning and late in the evening than in the middle of the day.

Age. — Persons of all ages are subject to the formation of these polypi: but it is of more common occurrence between the ages of forty and fifty than at any other period.

Appearance. — On looking into the nose, a jelly-like appearance is seen, which, upon directing the patient to inhale through the nostrils, recedes, and upon his exhaling advances and re-appears; the degree of motion, however, necessarily depends on the magnitude of the polypus compared with that of the nostril. The voice has a nasal sound, and there is generally some uneasiness felt between the eyebrows, in the situation of the frontal sinuses.

Seat. — The polypus grows from that portion of the schneiderean membrane which is situated upon the same side with the turbinated bones. I have

never yet seen a polypus growing from that covering, the septum narium. The body of the polypus is generally yellow, and is streaked with few vessels. Its neck diminishes often to a very small stalk. Now and then two or three polypi grow from a single stalk. When a polypus becomes very large, instead of advancing to the nostril it recedes into the throat, appearing behind the velum palati; and sometimes when it grows from the back of the nares, it makes its first appearance in the throat. It here becomes of very considerable size, and at length would readily allow a ligature to be passed around it; but this, as I shall presently describe, is not the best mode of its removal. When it appears in the throat, I have seen its body divided into a number of different portions.

In the collection at St Thomas's Hospital, their great size and broken surfaces are well seen in many preparations, as well as their origin from the pituitary membrane.

OF THEIR REMOVAL.

An operation necessary. — No other mode than an operation will succeed in removing these excrescences. I have repeatedly tried the application of caustic; but it only acts upon the surface, and the root grows faster than that surface can be destroyed. Aluminous and other astringent applications render the breathing a little more free at the moment, but produce no permanent relief.

Three modes. — Three modes have been proposed for their removal: 1st, by laceration; 2d, by excision; 3d, by ligature.

1*st. By laceration.* — 1st, Laceration is the usual mode. For this purpose, a surgeon should be provided with two pair of forceps; one pair slightly

curved, terminating in a point hollowed at the end, and that hollow containing pointed teeth, having an aperture in each blade. A second pair, formed like common dressing forceps, only the blades longer and more slender, having serrated teeth, received between each other like a serrated suture of the skull. These can be received into the smallest nostril, and readily made to act in any part of it.

Operation.—The operation is performed as follows: the patient sits upon a chair opposite a strong light, a probe is then introduced into the nostril, and the surgeon feels with it the exact situation of the stalk of the polypus; then withdrawing the probe, he passes the forceps to the stalk, and, enclosing it between the blades, with very gentle jerks, he either tears through the stalk, or draws away the portion of membrane from whence it grows: instead of removing it by jerks, the surgeon may turn the instrument upon its axis, and thus lacerate the stalk of the polypus. Now and then a thin film of bone separates with the pituitary membrane, which only more effectually secures the patient from a return of the disease.

If more than one polypus exist in the nostril, a separate operation is required for each; and if they exist upon each side, the operation may be performed on the same day in each nostril, for there is no danger in this operation. I never knew but one person die in consequence of it; he had previously had some disease in the brain, a piece of lint was placed in the nostril, after the operation, and this gentleman died a few days after of inflammation of the brain. It is better not to introduce lint, or any extraneous substance likely to produce irritation, immediately after the operation.

No serious hæmorrhage.—The hæmorrhage which results from this operation never amounts to any serious quantity.

As the disease is liable to return, when the inflammation succeeding the operation has subsided, aluminous injections may be used, or the liquor calcis with oxym: hydrarg: to lessen the disposition to the return of the complaint.

To remove them from the posterior nares, I have used curved forceps, introduced behind the velum; but they do not answer so well as the mode I have next to describe.

OF THEIR REMOVAL BY EXCISION.

2*d*, *By excision.* — This operation requires a pair of scissors with probed extremities, made straight, with long and slender blades.

Operation. — The patient being placed as in the former operation, the scissors are at first introduced shut, in order to ascertain the attachment of the polypus; and being then opened, the stalk of the polypus is cut through; then the surgeon, closing the other nostril, directs the patient to blow forcibly through that in which the operation has been performed, when the polypus is immediately ejected; but if the polypus appear in the pharynx, the surgeon divides the stalk in the same manner as before, and then putting his finger behind the velum palati, he with it draws the polypus away through the fauces. In that way the largest polypi are to be removed; and I have never seen either danger or difficulty arise from its performance; but, on the contrary, have several times succeeded when the forceps by the nostrils had been employed in vain.

Objection to this mode. — It has been objected to this mode of operating, that very considerable hæmorrhage is produced by it; but this can only arise from a very indiscreet manner of performing it, by repeatedly cutting the pituitary membrane, which could hardly happen with probed scissors.

3d, *By ligature.* — The third operation, namely, that by ligature, is now very generally abandoned by surgeons, on account of the difficulty of its application, and the necessarily imperfect removal of the disease.

Disease resembling polypus. — There is a disease in children very frequently mistaken for polypus, by men who have not had much experience in surgery. It is an elongation of the pituitary membrane of the nose, from relaxed constitution, and from effusion of serum into the cellular tissue of the part; it is red and very vascular. It appears more upon the extremity of the superior turbinated bone than upon the inferior; but I have seen it upon both. It sometimes becomes chronic. It requires alterative medicine, and the application of a solution of alum, or of sulphate of copper, or nitrate of silver. I have more than once known this disease removed by forceps cruelly and unnecessarily.

OF HYDATID POLYPUS.

Occurring in young persons. — The nostrils of young persons sometimes become filled with growths which appear of the hydatid or encysted kind. They resemble wetted bladders hanging within the nose, are unattended with pain, but produce the inconvenience of occasional obstruction. When pressed with forceps they burst, and discharge a mucus, somewhat resembling that secreted by the schneiderean membrane: the cyst only is removed by the forceps. The nose may be repeatedly cleared of them by instruments, but they are always regenerated. By continued growth they enlarge the nostrils, and deform the face.

Two modes of removal. By alum. — I have seen them removed in two modes: 1st, By the use of a

strong solution of alum introduced on lint, and constantly worn; 2dly, By the daily application of the muriate of antimony used by a dossil of lint through the medium of a canula. The first is the preferable mode; but I cannot decidedly speak as to its preventing the return of the disease: they are destroyed more quickly by the muriate of antimony, but with much more suffering.

OF THE CANCEROUS POLYPUS.

Occurs in elderly persons.—This is a disease of age.

Symptoms.—It commences with obstruction in breathing, but is, at first, unattended with pain; as the disease increases, the sufferings are very acute, and not confined to the diseased part, but extend to the different branches of the fifth pair of nerves, striking sometimes into the brain itself.

Slow growth.—Its growth is slow, and it is some time before it produces any discharge; but at length it ulcerates, and discharges a bloody serum.

Colour.—Its colour is purple; its feel is firm. It sometimes bleeds with great freedom. It sloughs, and in its progress it produces great alteration in the form of the face, which it disfigures horribly. It extends into the sinuses, and frequently affects the lachrymal sac.

It often alters the roof of the mouth, producing absorption of portions of the superior maxillary and palate bones.

Destroys life gradually.—It is a long time in destroying life; the latter days of the patient cannot but excite pity in the most unfeeling bosom. Medicine and surgery do nothing for this disease; excepting opium, belladonna, hemlock, and hyoscyamus are administered locally and constitutionally to mitigate, in some degree, the patient's tortures; and

the dose of the former is at last increased to keep the patient in a constant state of torpor.

OF THE FUNGOID POLYPUS.

Occurs at all ages.—The fungoid polypus occurs at all periods of life; but the best case which I can give of this disease is the following.

Case.—A young gentleman came to my house with a large purple excrescence projecting from the nostril, which completely obstructed the passage on that side. I made a cast of this disease, which is now in the collection at St Thomas's Hospital. There was a copious discharge of sanious fluid from it; but the disease was little painful, and the general health was, at first, but little affected. I passed a ligature around the root of the polypus as high as I could reach, and it sloughed away without hæmorrhage. I was gratified with the result of this operation, as the patient appeared to be greatly relieved; but some time afterwards I heard that the disease had returned, and that it had been again removed. It again grew, and ultimately destroyed life. The head was examined, and the disease was found to have grown from a very small surface of the pituitary membrane.

Extends.—In general the disease enters the different sinuses, affects the lachrymal sac, and ductus ad nasum; bleeds copiously, but has not the pain accompanying cancerous disease. The patient dies from copious discharge, the frequent hæmorrhages, and at last from nervous irritation.

OF POLYPUS EXCRESCENCES IN THE PHARYNX.

I have seen two cases of this disease.

Case.—One in a Spanish gentleman, who came

through Paris, where he consulted various surgeons; and on his arrival in London, asked my advice for a polypus excrescence in his pharynx, of the colour of the mucous membrane of this portion of the alimentary tube, beginning from the fold over the palato-pharyngeus, and hanging down like a sausage into the pharynx. By great efforts he could regurgitate it into his mouth. I requested him to permit me to pass a ligature around its root, which I succeeded in doing, without much difficulty, and it separated in eight days.

Case.—I lately saw a second case, with my nephew, Mr B. Cooper: it was similar to the former in appearance, but not quite so large, and grew more from the root of the tongue. I removed it also by ligature, and both these cases completely succeeded.

POLYPUS OF THE RECTUM.

I have several times seen the following disease.

Case.—A lady sent for me to see her infant, who, she observed, after a motion, had a substance like an earth-worm appear at the anus, of considerable length, and of a red colour. Upon examination, after an evacuation, I saw at the anus a red projection, and upon pulling it down, found it to be of considerable length, growing about an inch to an inch and a half from the anus, attached to the interior of the rectum. I drew it down, put a thread around it, and cut it off as near to its origin from the rectum as I could, and it never returned.

Case.—Some time after, a child was brought to me from Surrey, with the same disease; the substance looked like a leech, and I cut it off without putting a thread around it. Whilst at Lecture I was sent for to attend the child on account of hæmorrhage, and I begged Mr H. Cline to visit the patient for

me; but he soon returned and informed me, that the bleeding had been of little consequence, and had stopped spontaneously. The child recovered.

Case. — In a stone patient of Mr Gaitskell's, upon whom I was operating, the child having prolapsus ani, I saw a small excrescence, red and pendulous, growing upon the mucous membrane of the intestine, which I thought was the commencement of one of these diseases.

Case. — I have only twice seen this disease in the adult; once at the age of 23 years: I put a ligature upon its root, and removed a portion beyond the ligature, having the external appearance of a common earth-worm.

Case. — An apothecary of Bristol, a friend of Mr Brickenden, surgeon, in the Borough, came to me some years ago with a polypus growing in his rectum, about two inches from the anus, which I removed: he had previously been subject to dyspeptic symptoms, with great irritability of the rectum, which subsided after this operation, and the use of alterative medicines which were given him.

OF FUNGOID POLYPUS OF THE RECTUM.

Case. — A gentleman was brought to me by Dr Hopkins, of Peterborough, who laboured under this disease, the symptoms of which were a copious and sanious discharge from the rectum: very little pain; but upon his going to stool, or even by efforts in which the fæces were not discharged, a polypus was protruded, having a broken surface like a cauliflower, large as an egg, and of a dirty brown colour, breaking readily, and bleeding where it broke. The general health had not materially suffered. I put a ligature upon the neck of this polypus near to the mucous membrane of the intestine: it sloughed

away in a few days, and for some time the gentleman appeared to be well; but having occasion many months afterwards to go through Peterborough, I was requested to see this gentleman; when I found the disease had returned, that the rectum had ulcerated, and that his health was broken: soon after he fell a victim to the disease.

In the present state of medical and surgical knowledge, this disease, like the scirrho-strictured rectum, will prove destructive.

OF ENLARGED TONSILS.

Of frequent occurrence. — Enlargement of this part from common angina is a frequent occurrence; and it is best relieved by purging, by leeches applied to the throat, or by a blister placed beneath the angle of the lower jaw.

Sometimes suppurate. — If the gland suppurate, the pain is exceedingly severe; the attempts to swallow are agonizing, and the painful sensations extend along the Eustachian tube to the ear. When matter has formed in the tonsil, it may be detected by applying the finger to the surface of the gland in the fauces.

Treatment. — Fomentations and poultices assist its progress most effectually; and I think, upon the whole, that they do best when left to break spontaneously. But when great difficulty of breathing attends the presence of matter, it should be discharged by puncture with a small lancet, or with the knife used to divide the cornea. Some danger attends the operation of opening such abscesses, and circumspection is required to prevent a wound of the internal carotid artery.

After the matter is discharged, the case speedily does well.

Chronic enlargement. — Sometimes a chronic en-

largement of the tonsils occurs, and injures the health by the difficulty of breathing it produces, the person is obliged to sleep with the mouth widely opened, yet still there is much impediment to the passage of the air, and consequently much stertorous noise.

Symptoms. — Children labouring under this disease are often found during sleep in profuse perspiration, especially about the head, arising from this excessive dyspnœa.

Treatment. — The treatment of this state consists in applying powdered alum to the surface of the tonsil; in using the sulphate of copper, in substance, so as to whiten the surface; or the nitrate of silver, which produces the same effect, and from the employment of which I have known great advantage derived; scarification I have also seen of service.

Removal sometimes required. — If the disease resists these modes of treatment, it will be right to remove the enlarged portion of the gland, either by ligature or by excision.

By ligatures. — A ligature is employed in those cases in which the tonsil is pendulous, and in which the enlarged part is connected to the throat by a narrow neck.

To apply a ligature, an iron is required, with a small fixed ring at its end, and a waxed portion of silk.

Operation. — The patient sitting before the surgeon, and the thread being passed through the ring of the tonsil iron, an assistant holds one end of the ligature against the cheek, and the surgeon retains the other in his hand. The iron is then carried above, behind, and then below the tonsil, and is, with the end of the ligature, brought out of the mouth; after thus nearly surrounding the gland, a single knot is made, and one end of the thread being again passed

through the ring of the tonsil iron, the knot is by means of it made fast, and a second knot is then made, in the same manner. The silk is left upon the tonsil until it ulcerates through the gland, which it does in about a week.

Another mode. — When the basis of the swelling is large, a needle has been advised, armed with a double ligature, which is to be passed through the base of the gland: then each ligature is to be tied separately, one before and the other behind the tonsil, and by this mode the ligatures are prevented from slipping; but their application is very difficult, and, as far as I have seen, very imperfect. Rather than adopt it, I advise the removal of a portion of the gland by excision.

By excision. — This is to be done by a pair of curved scissors with probed extremities, with which there is less risk of wounding any important part. It is best, however, to remove small portions, and to proceed gradually, by repeating the operation as occasion requires; and to touch the surface with nitrate of silver or sulphate of copper.

In these cases there is usually much general debility, and it is right to give soda, steel, and rhubarb, and advise country or sea air with bathing, and a generous diet.

OF ELONGATION OF THE UVULA.

Sometimes of great length. — I have seen this part grow to a considerable length. There is one in the collection at St Thomas's Hospital, which the boy could throw forwards between his incisores teeth.

Symptoms. — By hanging upon the epiglottis, it produces coughing, or by irritating the pharynx it occasions sickness; and by creating irritation of the glottis it produces an alteration in the voice.

Cause. — It arises from relaxation and over exertion of the voice in speaking.

Treatment local. — Stimulating gargles, sulphate of copper in solution, or directly applied in substance, and alum, are useful; but sometimes the enlargement becomes so distressing, as to occasion a necessity for its immediate removal.

Operation. — The mode in which this is effected is as follows. The end of the uvula is seized with a pair of polypus forceps, and it is then drawn forwards, so as to be put upon the stretch, and that portion which exceeds the natural length of the part is removed by a pair of curved and probed scissors.

No bleeding of any consequence follows; and the only attention afterwards required is, to avoid any unnecessary exposure to cold air.

Not dangerous. — I have several times had occasion to perform this operation, and have never seen any ill effects arise from it, but often the greatest advantage produced.

LECTURE XXVIII.

PARACENTESIS OF THE ABDOMEN.

Two kinds. — Dropsy of the abdomen is of two kinds: 1st, Peritoneal, or ascites; 2d, Encysted, or ovarian.

OF ASCITES.

Symptoms. — The first symptom of this disease is an unnatural sense of fulness in the abdomen after taking food, which renders it necessary to loosen the clothes; next, an increase of the lower part of the abdomen, observable at all times whilst the patient is in the sitting posture. When the patient lies down, the increase in the abdomen is general, and the enlargement is accompanied with an unusual tension; as if the abdomen were inflated. In the sitting posture, a fluctuation can be perceived in the hypogastric and lower part of the umbilical regions, by placing the fingers on one side and tapping on the other. In the recumbent posture, the intestines appear to undulate in the cavity, having more than their usual motion. As the disease increases, the swelling extends from the lower to the upper part of the abdomen, occupying the whole cavity.

Little pain is felt, but considerable inconvenience arises from the distension, more particularly when the patient is in the recumbent position, on account of the action of the diaphragm being impeded. In proportion as the distension is greater, the fluctuation becomes distinct; and when the tension is ex-

treme, the gentlest tap on the abdomen leads to a perception of the fluid. The secretion of urine is scanty. The enlargement of the abdomen is followed by swelling of the legs, either from the pressure of the fluid upon the veins returning the blood from the lower extremities, or from the general debility which accompanies this disease. I have known, when the omentum has been very considerably thickened, the perception of the fluctuation in the abdomen to be indistinct; and, under the same circumstances, in tapping, the quantity of fluid which has escaped has been a portion only of that contained in the cavity, part being confined behind the omentum.

Quantity of fluid. — The usual quantity of fluid collected is from twenty-eight to thirty pints; but when a patient has been tapped several times, the abdomen becomes much more enlarged, and the quantity is then from thirty to forty pints. In young persons the quantity is small; and the smallest quantity I have known drawn off by operation was in a medical student; it amounted only to six pints.

Nature of the fluid. — The nature of the fluid secreted varies but little in ascites; it is much more watery than serum, containing relatively a small proportion of albumen. It has generally a watery appearance, has a slight yellow tinge, and does not vary in its appearance and consistence, as the fluid of other species of dropsy. If inflammation succeeds the performance of the first operation, flakes of fibrin or adhesive matter are contained in the fluid next discharged.

Cause. — The cause of dropsy, when it is confined to the abdomen, is most frequently a disease in the liver, which acts mechanically in producing it. The pressure which the diseased organ occasions upon the vena portæ interrupts the free flow of blood

through the vein, produces a congestion in the arteries and veins of the alimentary canal, and of the organs which are connected with it, and consequently leads to a greater effusion from the exhalent extremities of the arteries. Diseases of particular abdominal organs will, by the irritation they excite upon the peritoneum, occasion a greater determination to its secreting surface. Thus disease of the omentum, or of the spleen, will produce this effect.

I have known diseased mesenteric glands produce ascites; and two children, who, in my recollection, have been tapped for this disease, have recovered. Taking large quantities of spirituous liquors tends to produce this complaint, independently of the organic change it is likely to excite in the liver; its stimulus leading to a greater determination of blood to the vena portæ than can readily circulate through this vessel, and consequently to effusion from the extremities of the arteries.

But ascites is frequently the effect of disease in the chest, of water accumulated in the cavities of the pleura, of water in the pericardium, or of some organic change in the heart, interrupting the action of the source of the circulation: the blood therefore accumulating in the right side of the heart and in the veins returning the blood to the right auricle, leads to the production of water in the abdomen, and of a general anasarcous state.

It has been a question whether dropsy arises from an increased secretion of the blood-vessels, or from an absolute diminished action of the absorbent vessels. It is generally the former I have no doubt, for reasons which I have already given, when speaking of hydrocele.

OF THE TREATMENT OF ASCITES.

Medical. — The disposition to this disease may be prevented, its progress, when it has begun, may be retarded, and large accumulations of fluid may be removed by medical treatment, and by external applications. If the disease originate in a complaint of the liver, the restoration of its secretions, and an action upon the alimentary canal by mercury, combined with other purgative remedies, become the best means of preventing effusion. If the complaint originate from local disease in some of the other viscera, as in the spleen, or omentum, the secretions must be increased in a similar manner, and blisters should be applied, and for some time continued, on the abdomen.

If water has already begun to form, the best medicines, as far as I know, are the submurias hydrarg: gr: jss. pulv: gambogiæ gr: ss. scillæ gr: iij. in the form of a pill, taken every night: and spir: æther: nitric: 3ss. to 3j. oxym: hydrarg: gr. ½. tinct: digital: gutt. xv. with some camphor mixture, twice or three times in the day.

If water has already formed in considerable quantity, and if the powers of the constitution are sufficiently strong for its employment, the use of elaterium becomes not only justifiable but desirable, as being the most powerful and successful mode of promoting the absorption of the fluid which has been effused. But if the powers of the constitution have been much enfeebled, this remedy becomes dangerous from its severe effect. Even if the ascites be accompanied with other dropsical symptoms, the elaterium is still the remedy most to be depended upon, if the constitution will allow of its use.

An operation necessary. — When medicines fail of

their wonted and expected influence, and the accumulation is so considerable as to impede breathing by preventing the free descent of the diaphragm, or when the patient finds it difficult to assume the recumbent posture, it becomes necessary to remove the accumulation by the operation of paracentesis. I have, however, known in a young person the operation performed for comparatively small collections of fluid, when the increase of the collection had ceased, and no disposition to its absorption had manifested itself. It is absolutely necessary that the fluctuation should be extremely distinct before the operation be proposed; and in cases of diseased liver, spleen, omentum, and mesentery, there is danger of the surgeon's being deceived respecting the disease.

Result of an operation. — With regard to the result of the operation for ascites, when the dropsy arises from disease of the liver, or from organic alteration in the chest, the relief is only temporary; but when it is the effect of constitutional disease, as fever, or arises from functional change only, under these circumstances the operation of paracentesis is frequently followed by a cure. Even in diseased liver, after the removal of the water by the use of the medicines which we have already recommended, I have known the patient ultimately recover. Considerable pressure upon the abdomen after the operation, lessens the disposition to the return of the effusion. Before the operation of paracentesis is described, I shall speak of ovarian or encysted dropsy.

OF OVARIAN OR ENCYSTED DROPSY.

This is a bladder of water, formed within or upon the ovarium.

Symptoms.—The disease is, at first, discovered as a swelling upon the brim of the pelvis, from two to three inches above Poupart's ligament, and is confined to one side of the pelvis. It is unattended with pain, and the general health remains uninjured. Under varied positions of the body it moves, in some degree, from side to side. It is a very circumscribed swelling, and has an elastic feel; it is often accompanied in its early stages with an irritation to make water, and now and then with a difficulty in its discharge.

Progress.—As it gradually increases it rises from the lower part of the abdomen to the upper, and occupies more and more the centre of the abdomen; at length it extends over to the opposite side from that in which it began: although it is generally largest on the side in which it commenced; at first the breathing is unaffected; but when the size of the swelling is very large, the action of the diaphragm is greatly impeded by its pressure.

Fluctuation.—The fluctuation in this disease is much less distinct than in ascites; but when it acquires considerable size, it becomes proportionally more and more perceptible. It depends, however, upon the thinness of the cyst. In ascites the fluid is in direct contact with the peritoneum, on the posterior surface of the abdominal parietes; but in ovarian dropsy a cyst sometimes of considerable thickness intervenes between the water and the peritoneum.

Solid enlargement.—The ovarium is subject to solid enlargements of very considerable bulk; and an ignorant surgeon might plunge a trocar into such a swelling, mistaking it for ovarian dropsy, which a little more attention to its want of fluctuation might have led him to discover.

At first the water which is formed in the encysted dropsy is contained, not in a single bag, but in

several; the septa between which become gradually absorbed, and their number consequently diminished; and this is another reason for the fluctuation being more distinct as the disease advances. The cyst which is, at first, of considerable density, becomes thinned by a process of absorption, leading to a more distinct perception of the fluid.

Nature of the fluid. — The fluid contained in an ovarian cyst varies much in appearance, it being sometimes watery; sometimes serous, containing a large quantity of albumen; sometimes mucilaginous and tenacious, so as to be ropy, but yet coagulating little under the influence of heat.

Its colour. — The colour also varies; sometimes being yellow like serum; sometimes it is brown and frothy; three times I have seen it yellow like pus, and containing similar globules. One case with Mr Simpson, surgeon, in Lime Street Square, in which a pail-full of this fluid was drawn off; a second in a Miss Warner, of the Kent Road; and a third in a Mrs R. of Chatham Place, whom I lately attended with Dr Key.

Hydatids. — I have seen hydatids discharged with the fluid.

Quantity of fluid. — The quantity of fluid accumulated in this disease is necessarily varying, but the proportion averages from twenty-five to thirty-two pints. The greatest increase of the ovarium which I have seen is in the collection of St Thomas's Hospital, in which the accumulation was ninety-seven pints. The least which I have removed has been sixteen pints.

Case. — The following is the account upon a tombstone near Dartford, Kent. 'Here lies the body of Ann Mumford, daughter of John Mumford, Esq., of Sutton Place, in this parish. Her death was occasioned by a dropsy, for which, in the space of three

years and ten months she was tapped one hundred and fifty-five times. She died the 14th of May, 1778, in the twenty-third year of her age, an example of patience, fortitude and resignation.'

This then is a proof of extent of the secretion, and of the necessity, in some cases for the repetition of the operation.

Situation of the cyst. — In the collection of St Thomas's Hospital there is a preparation showing the origin of this disease; in one ovarium bags are formed within its tunica albuginea; on the other side, a cyst is produced externally to the ovarium, but pendulous from it; thus there are some cases of it internal and some external to the ovarium.

Adhesion of the cyst. — At first the bag does not adhere to the peritoneal lining of the abdomen; but as it becomes large, it gradually acquires such adhesion; and, upon dissection of these cases, the cyst is found to have united itself with the parietes of the abdomen, so as to leave no space between it and the peritoneum: the intestines and omentum are situated behind it, under great accumulation.

Burst by accident. — The ovarian cyst sometimes bursts by accident.

Case. — Miss Warner, to whose case I have already alluded, was thrown out of a one-horse chaise, and burst the ovarian cyst. She soon afterwards began to make large quantities of water, and the disease disappeared; but in seven years it returned, and she was obliged to be tapped.

Case. — A lady with ovarian dropsy, in getting from her bed, fell against the corner of the night-chair, and ruptured the ovarian cyst, producing considerable extravasation of blood externally: her secretion of urine became abundant, and her abdomen much lessened; but the disease afterwards returned.

Medical treatment. — With respect to the medical

treatment of ovarian dropsy, I fear a difference of opinion with many other medical men, when I say, that medicine has but little influence over this complaint.

I have seen the most gentle, as well as the most drastic medicines given to promote the absorption of the fluid, but without success; and when we consider the little vascularity of the cyst in which the water is contained, and also how little influence medicine has over common hydrocele, we shall not be inclined to expose our patients to the trial of these agents.

Case. — Dr Baillie and myself attended a lady together, who could only hiss her answers to our questions; and when we asked the cause, we learned that for an ovarian dropsy, of which she afterwards died, she had undergone a course of mercury, which had occasioned a sloughing from the inside of her cheeks, without relieving her dropsy: the contraction of the cicatrices in the mouth had produced the alteration in her voice.

Diet. — With regard to diet, I tried in a case of dropsy the following experiment. I tapped a woman in Spitalfields, and I ordered her afterwards not to drink, but merely to suck an orange when she was thirsty: with respect to her solid food I put her under no restraint. The next time I tapped her, I allowed her to take as much fluid as nature prompted, but she filled faster with water in the former than in the latter case; the cause of the difference appeared to me to consist in the excitement of the kidneys which the fluids occasioned.

Pressure. — A considerable effect is produced in retarding the progress of this disease, by the patients wearing a belt, which, by its pressure, prevents the ready secretion from the exhalent extremities of the vessels into the interior of the bag. I

therefore always lay my patients under the injunction to obtain and wear one.

A patient who is affected with this disease has the general health so little deranged, as not to require any change in the general mode of living; exercise may be taken, and the same diet allowed as under ordinary circumstances.

OF THE OPERATION OF PARACENTESIS.

Not to be performed early.—This operation ought never to be performed early in the disease, but it should be deferred until the accumulation of water by its pressure upon the diaphragm influences the function of respiration.

Reasons for delay.—If the quantity of water in ascites be but small, much danger is to be apprehended of the trocar reaching the viscera; and in the ovarian dropsy the operation must not be performed early, because the adhesion of the ovarian cyst to the peritoneum on the fore part of the abdomen is not yet produced. The viscera, therefore, glide down between the cyst and the parietes; and I once saw, in a case of ovarian dropsy, the omentum caught by the canula, and a portion of it was brought through the opening in withdrawing the instrument, which was obliged to be returned by a probe; inflammation succeeded, and the woman died. This might have been avoided by further delay; therefore the operation should not be performed until the ovarium ceases to move easily from side to side.

A second reason for delaying the operation exists in the numerous cysts of which the tumour is first composed, which afterwards break into one; but when the operation is performed early, the escape of water is only from a single small cyst.

Before performing the operation in the encysted dropsy, as the fluctuation is much less distinct than in ascites, the greatest care is required to prevent an error.

I will here mention two circumstances, in one of which my character was exposed to considerable risk; of the other, I was informed by a medical man who was invited to witness the operation.

Case. — In the first case, I was desired to see a lady who I was told laboured under dropsy. When I entered the room, I saw a tall delicate female with an immense abdominal swelling, giving a distinct sense of fluctuation. I requested the physician accoucheur whom I met, to examine if the lady was not with child; he said, he thought it was unnecessary, as the fluctuation was very distinct, but that he would do so, and let me know the result in a few days. I heard no more of her for a week, and then I learned that she had been put to bed on the morning following my visit. I would not have performed the operation of paracentesis for the universe.

Anecdote. — The circumstances which were told me of the other case were as follow: A surgeon in a country town called upon another surgeon, and said, 'I am going to tap a woman to-morrow; perhaps your young gentlemen would like to be present.' As it was an operation they had never witnessed, they most readily accepted the invitation; they were shown into a room in which the patient was already prepared to undergo the operation, she sitting at one end, with her abdomen bare. The surgeon then, taking his trocar and canula, went to some distance, and walking up to the patient with the trocar presented, he charged, as it were with a bayonet, and plunged it into the abdomen; then withdrawing the trocar with an air of triumph,

it was with no small chagrin he found not a drop of water escape; but however, still undismayed, he withdrew the canula, and again renewing his attack, he a second time introduced the trocar into the abdomen; but was equally unfortunate as before, in finding that no water followed. Waiting a few moments, he withdrew the canula, and turning round to the gentlemen, he said, 'You may do her up;' by which he meant, they might apply the bandages; and he added, 'This, gentlemen, is an operation which you probably never saw before, and which most likely you may never see again. This is what we call the operation of dry tapping.'

Before performing this operation, the patient should be placed upon an elevated seat with the abdomen bare, a sheet is to be doubled to about a foot in breadth, and is to be passed around the body at the upper part of the abdomen, and the ends being crossed at the back, are to be held by assistants; but instead of doing this, I frequently suffer my patient to remain in the horizontal posture in bed, turning only to the side; by this plan, that faintness is prevented, which usually attends the escape of the water if the patient be in the sitting position; a pail is required to catch the water in the first instance, and a basin afterwards. The necessary instruments are a trocar and canula, or a lancet, with a canula shut at its end like a catheter, and with holes on its sides equal in diameter to the canal of the canula.

A long trocar necessary in ovarian dropsy. — If it be ovarian dropsy, and the cyst possess considerable thickness, it is very desirable that the surgeon should be provided with a trocar and canula of an inch more than the usual length, as I once operated upon a patient of Dr de Vallangin, in whom I was obliged to employ a much longer trocar and canula,

being unable to reach the cavity of the cyst with an instrument of the common length.

The proper spot for the introduction of the trocar. — The place at which the operation is performed was changed by Mr Cline from midway between the umbilicus and anterior superior spinous process of the ilium on the left side to one inch below the umbilicus; and his reason for this change was, that in the spread of the abdominal muscles from the pressure of the water, the epigastric artery is brought into a situation of risk of being wounded by the trocar, a circumstance which did happen to Mr Cline. He was tapping a person in St Thomas's Hospital, and he saw florid blood issue through the canula; the quantity gradually increased as the water flowed; and as the patient was becoming faint, he withdrew the canula and closed the wound, but the bleeding continued into the abdomen, and the man died; upon inspection, the epigastric artery was found wounded.

Reflecting upon this circumstance, he was led to consider, that an inch below the umbilicus in the linea alba would be the safest spot for the introduction of the trocar, as no vessel would be there endangered, and it was only required that the bladder should be previously emptied. This part has been therefore of late years usually selected for the operation.

Danger of operating at the umbilicus. — Some have recommended the umbilicus, but the frequency of hernia renders that spot unsafe. An inch above the umbilicus has been also advised; but if there be hernia, it is equally dangerous with the umbilicus itself; and if the umbilical vein remain unclosed, there is a danger of hæmorrhage in performing the operation at that part.

Beside the danger to the epigastric artery in the operation performed at the part formerly selected, there was danger of wounding the spleen when it had become enlarged.

Operation. — The surgeon should place himself on a low stool by the side of the patient; the sheet is then tightly drawn by the assistant across the upper part of the abdomen, by which its lower part is rendered prominent, and the point of the trocar is placed an inch below the umbilicus, and is passed slowly and gently through the linea alba; the trocar is then withdrawn, and the canula being left in, the water is allowed to escape through it. If any interruption to the passage of the fluid by the pressure of the omentum, or of the mesentery on the end of the canula arise, a probe should be gently passed through the interior of the canula to remove the obstruction.

Canula left in the wound. — It has been recommended by Mr Guy of Chichester, and others, to leave the canula in the wound, occasionally to suffer the water to flow, and thus prevent its future accumulation.

Sometimes produces a cure. — A slight inflammation of the peritoneum in these cases sometimes succeeds the operation; and by the change of action thus excited in the vessels, its disposition to a future secretion is lessened, and in this way a cure is produced.

Pressure. — Immediately after the operation has been performed, a belt is to be tightly applied around the abdomen, to prevent the re-accumulation of water by lessening the determination of blood to the parts.

Operation rarely successful. — The result of the operation is generally unsuccessful in ascites, as the greater number of cases are accompanied with organic disease: the operation only acts upon the ef-

fect, and not upon the cause, and the hope of permanent advantage must be derived from medical treatment, and not from surgical operation; but the removal of the water gives additional facility to the operation of the medical means which are employed.

With respect to the ovarian dropsy, the operation is the only means of relief; but it generally fails in producing a permanent cure.

In ascites forming after fever, and after a course of mercury, and in ascites unaccompanied by organic disease, I have known the operation succeed in producing a permanent cure. In ovarian dropsy, the instances of permanent cure from operation are exceedingly rare.

The case which I have given from the neighbourhood of Dartford shows the number of times this operation may be repeated.

In the very young and in the very old, I have known the operation succeed.

Spontaneous cure of ovarian dropsy.—Of a spontaneous cure of ovarian dropsy I have known several examples.

Case. — The wife of a veterinary surgeon had an opening at the umbilicus produced by ulceration, through which large quantities of fluid were for a length of time discharged; but the opening ultimately closed, and the disease did not return.

I have known the water discharged by the Fallopian tube; and I attended a lady in whom an ovarian cyst burst into the intestinal canal; for several years afterwards she was subject to occasional returns of the disease, but ultimately recovered.

I have known a person die from suppuration of an ovarian cyst.

Injection of the cyst. — The injection of an ovarian cyst has been occasionally practised with success;

but it has also failed; so that its salutary influence remains in doubt.

Removal of the cyst. — The removal of an ovarian cyst from the abdomen might be performed in the early stages of the disease by making an opening into it, discharging its contents, and by dividing the membranous bag from its natural adhesions.

OF PARACENTESIS OF THE THORAX.

When required. — This is required for accumulations of matter within the cavities of the pleuræ, or matter partially encysted in those cavities. With respect to a collection of water in the thorax, I have only once known an operation performed for it, which proved unsuccessful; the effusion of serum being only the effect of some more formidable disease.

OF EMPYEMA.

Causes. — Collections of pus in the chest are the result of inflammation of the pleura, or of the pericardium; but as the latter does not admit of relief, I shall only describe the former.

Symptoms. — The formation of matter in the cavity of the pleura is preceded by the usual symptoms of pleuritis — viz, pain in the side, cough, a hurried breathing, and imperfect expansion of the thorax; these are succeeded by rigors and greater dyspnœa, by a frequent, small, and often irregular pulse; and if the disease be confined to one side, the patient can only rest on one side. When the sides of the thorax are accurately compared, the diseased is found to be considerably larger than the sound side; the upper part of the abdomen is also much fuller on the

side affected; a tense and elastic swelling may be felt there, varying with the state of respiration.

A swelling of the legs succeeds from the pressure of the accumulated fluid affecting the free circulation of the blood through the lungs, as well as altering the position of the heart.

Spontaneous cure. — Nature occasionally performs a cure, in the following manner: The intercostal muscles give way to the pressure of the matter, or an ulcerative process is produced, by which the pus escapes to the outer side of the ribs under the integument, which at last also ulcerates, and thus the matter becomes discharged.

Case. — I was sent for to Miss B—, in Chatham Place, Blackfriars, to meet her medical attendant, Mr Murley, on account of her being under the following circumstances. She had great dyspnœ, severe cough, a quick small pulse, great emaciation, and hectic flushes, succeeded by rigors. When I examined her left side, I found a large swelling in the situation of the spleen, and another, about the size of a walnut, between the third and fourth ribs; when I pressed upon the tumour in the situation of the spleen, that between the third and fourth ribs became enlarged, so that there was evidently a fluid fluctuating between the two swellings. Thus I found that the enlargement on the left side of the abdomen was occasioned by a descent of the diaphragm from accumulation of fluid in the chest, and I did not hesitate to advise that an opening should be made into the small and circumscribed swelling between the ribs.

This being done, an immense flow of matter immediately succeeded; and when the swelling in the region of the spleen was pressed the flow increased. After a very long continued and copious discharge,

this young lady recovered, and now enjoys good health.

Case. — I attended a young lady in Seymour Street under exactly similar circumstances, and she also recovered from the same plan of treatment. These abscesses would of themselves soon have burst, but I thought it better to save the constitution by aiding the efforts of nature.

The pus does not always point externally. — It frequently happens, however, that the accumulation of pus in the thorax is not accompanied by a partial swelling between the ribs, and under these circumstances the surgeon must be guided in his judgment by the symptoms I have described. In this case, it will be required to make an incision into the thorax without any well marked circumstance in the disease, to direct the situation of the opening. The surgeon will then consider in what place the wound will be the most dependent, so that the matter may readily escape.

Operation. — As the patient should be in the sitting position at the time of the operation, the lower part of the chest should be selected between the seventh and eighth, or eighth and ninth ribs, and the opening should be made rather posteriorly to the side of the thorax, so as to completely avoid the diaphragm. The skin being drawn up an inch, an incision is to be made through it upon the upper edge of the rib; after which, the intercostal muscles are carefully divided; and a straight canula closed at its end like a catheter, but having holes in its sides, is then passed through the pleura, and the pus is allowed to escape through it. When the matter has been thus evacuated, the canula is removed, and the skin being let go, the external and internal wounds are no longer opposite to each other, and union is more readily effected.

The reason for making the incision upon the upper edge of the rib is to avoid the intercostal artery, which is placed in a groove in its lower margin.

Sometimes succeeds.—This operation I have known succeed, although it is generally unsuccessful.

Case.—A Mr Bryant, in the city of London, had this operation performed upon him, by Sir B. Harwood, and he ultimately recovered.

Spurious empyema.—Collections of pus in the thorax are sometimes partial, and then the disease is called spurious empyema.

How produced.—An adhesion forms between the pulmonary and costal portions of the pleura, between which also matter becomes deposited, so that the general cavity of the chest is excluded from the accumulation. This abscess ulcerates the intercostal muscles, and breaks externally, after having been the occasion of excessive pain, dyspnœa, and cough.

Case.—A boy, who had been a long time at sea, and who had been very much the subject of sea-scurvy, was sent to my house by his mother, on account of a large accumulation of matter upon the left side of his thorax, a part of which passed to and fro between the ribs, and projected very much if he made a deep inspiration, or coughed. Seeing him in ill health, I was fearful of making an opening, but advised him, on account of his scurvy, to take bark with sulphuric acid; under the improvement of his general health which this treatment effected, the matter became entirely absorbed, and the boy perfectly recovered.

Treatment.—The treatment of spurious empyema is that of common abscess, viz, fomentations and poultices; and the opening is to be left to nature or performed by art, as the constitution is able or unable to bear the process of ulceration.

LECTURE XXIX.

OF HARE-LIP.

Definition.—This is a congenital fissure in the upper lip, which resembles the form of the lip of the hare.

Many varieties.—But the deficiency of the lip and palate is liable to great varieties.

Simple fissure.—1st, It is frequently a simple fissure, extending from the edge of the lip nearly to the nostril.

Entering the nostril.—2dly, It is sometimes more extensive, and is accompanied with greater separation, when it enters the nostril.

Double fissure.—3dly, The defect occasionally exists on each side, and extends into both nostrils.

Extending through the bone.—4thly, the fissure is not confined to the lip, but extends into the superior maxillary bone, and sometimes along the whole of the superior maxillary and palate bones, and through the velum palati.

Double fissure extending through the bone.—5thly, A fissure is sometimes seen opposite each defect in the lip, which extends through the maxillary and palate bones, leaving an insulated portion of each of these bones in the centre.

Fissure only in the palate.—6thly, The defect in the palate is in some cases a circular opening, either in the bone or in the velum palati only.

Cause.—As to the cause of this defect, it may be remarked that such deficiences are more frequently observed in the median line of the body than in any

other parts. The body is constituted in the greater part of two halves rather than of one whole; thus it is obvious, that the brain and nervous system of one side of the body is distinct in its functions from the other side; as for example, in cases of paralysis the nervous defect is confined often to one half of the body.

I have seen a child born with half its face; its arm and leg on one side much larger than on the other.

With regard to the organs of sense, they are each of them double. In the organs of smell and taste, although less apparently double than those of sight, hearing, or feeling, yet the function of one half of the tongue and one half of the nose may be lost, and the other half remain perfect.

It is at the median line that the union of the two halves of the body may be said to be produced: there it is that the nerves unite, and the blood vessels inosculate; and from deficiency in that inosculation arise the defects which are so frequent in the central line of the body, viz, the defects in the lip and in the palate; a want of the sternum; a deficiency of the linea alba to a great extent; also of integument, pyramidal muscles, and fore part of the bladder; the prepuce imperfectly formed at the frænum; an aperture in perineo in the male giving the appearance of the hermaphrodite.

Exceptions. — The exception to this rule is in the abdominal viscera, which are supplied by azygos branches from the aorta and by nerves from the ganglia.

Contrary effects. — On the other hand, the inosculation in some instances is unusually free, producing a closure of the anus, or of the pudendum in the female.

Fissure in the lip easily cured. — The congenital

defect in the lip may be readily repaired by the process of adhesion, and this becomes desirable not only on account of the disgusting deformity which it produces, but also from its influence upon the nourishment of the child, its food returning by the unnatural aperture in the attempt to swallow it. The edges of the fissure in the lip are therefore pared away, the raw surfaces are preserved in complete contact, inflammation arises, adhesive matter is effused, and vessels shooting into the adhesion produce a living union of the parts.

Proper age for an operation. — It becomes a question of importance, at what period of life the operation should be performed, whether immediately after birth, at from three to six months of infancy, or after dentition is completed.

It is undoubtedly true that adhesion is most sure to be lasting after the period of dentition, and that this operation, therefore, scarcely ever fails when performed between two years and the adult age; on the contrary, during dentition it is attended with some danger, and sometimes the adhesion is destroyed by the violent efforts of the child; soon after birth the operation often fails, and is attended with considerable danger.

Of the proof of the danger during the period of dentition, I will mention the following case. A child of a clergyman, of more than six months of age, was sent to me from the country to be submitted to this operation. I advised that it should not be performed, but the answer was that the mother could not bear to see the child with this deformity. I operated; the child became feverish, the gums inflamed, and an incisor tooth partially made its appearance; the child was attacked with purging of the most severe kind; and, on the fifth day following the operation, it died.

Danger soon after birth.—The danger, however, is much greater if the operation be performed soon after birth; the nervous system is then so exceedingly irritable, that convulsions are readily produced, and the loss of a small quantity of blood occasions a fatal influence.

Case.—I was operating, at Great Yarmouth, upon an infant with hare-lip in the presence of Dr Girdlestone, when he said, 'Have you no fears of the child's dying?' to which I replied, 'I never saw one die from this operation;' he told me that he had witnessed an operation upon a child, which was soon after seized with convulsions, and of those convulsions it died.

Case.—I was requested by Mr Price, surgeon, in Tower Street, to see a child, born the preceding day with hare-lip. I performed the operation, the infant lost but little blood; on the following day, when I called upon Mr Price to accompany him to visit the child, he informed me that it was just dead, and that it had lived only twenty hours after the operation.

Case.—An infant was brought to my house in Broad Street with hare-lip. I operated upon it upon a Monday, and desired that it might be brought to me upon the Thursday; the mother called upon the Thursday to inform me that the child was dead.

Case.—During the year 1824 an infant was brought to my house, with an hare-lip of the most simple kind, and its parents were determined to have the operation performed: this was done upon a Monday morning; on the Tuesday the father of the child came to my house, and said, 'Sir, my child vomited very much last night, and is this morning in a state of stupor.' I directed him to give the infant some calomel, and put it in the warm bath; I called at the house in the evening, when I found that the child was dead.

Thus the danger at the infantile period is considerable, and the operation also often fails when the life of the patient is not endangered. I operated, in the presence of Mr Cline, upon an infant, the daughter of the marshal of the King's Bench, but the lip flew open when the ligatures were removed.

Case.—I was requested to perform this operation upon a boy about twelve years of age, who had been operated upon in his infancy by one of the first surgeons in the city of London, yet the union had been so imperfect that a second operation was demanded.

Practical conclusions.—The conclusions, therefore, as far as my own experience dictates, are these: That prior to six months there is danger of a want of union, and even of the loss of life; that from six months to two years, during the period of dentition, the operation should not be performed; that, after dentition is completed, there is little risk of failure either as regards the union of the lip, or the life of the child.

Sometimes an early operation beneficial.—Notwithstanding I feel it my duty to mention these adverse circumstances, yet I have known the operation performed, and have performed it myself in infancy, with very complete success; and in those cases in which a fissure has existed in the upper jaw, the union of the upper lip has, by its pressure upon the bone, led to an approximation of the edges of the fissure so as to produce considerable advantage by the early operation.

Two modes of operating.—The operation may be performed with a simple interrupted suture or with pins. Mr Cline, who had great experience in his profession, preferred, and in his lectures recommended, the former. The truth is, that it may be very successfully performed with either; but the interrupted suture is the most simple, and, as far

as I have seen, equally effectual; it has this great advantage, that it prevents the disturbance to the adhesion, which the lip receives in the removal of the pins.

Operation. — The steps of the operation are as follows: The child is to be recumbent with its head placed over a pillow, the surgeon then extends the lip from the nose, and if any adhesion to the gum prevents its being extended, such adhesion must be first divided; he next introduces a pointed and curved bistoury, at the angle of the fissure, carries it down to the red edge of the lip, and thus removes the surface from one of the sides; the removal of the opposite surface is effected from the angle of the fissure in the same way. A straight needle armed with a waxed silk is afterwards passed through each side of the lip, at the juncture of the skin with the red part, and about the eighth of an inch from the raw surface; then another needle and ligature being introduced through the integument, half way between the first suture and the angle of the fissure, the edges of the fissure are brought together by tying the portions of silk, the lower one should be secured first; and when both are tied, the ends of the silk are to be cut off above the knots, and thus the operation is concluded. There is not any necessity for applying adhesive plaster; and the more the part is exposed to the air, and the more dry it is kept, the better. The coronary artery of the lip bleeds freely in the operation, but it ought not to have a ligature applied upon it, as when the sutures are tightened the orifices of the artery become sufficiently compressed to prevent hæmorrhage.

Removal of the sutures. — The general rule for the removal of the sutures is on the fourth and fifth days. On the fourth day take away the upper thread, and upon the fifth day the inferior one; but al-

though this is the general rule, yet if there be much inflammation or tendency to suppurate about the sutures, both should be removed on the fourth day.

After-treatment. — After the removal of the sutures, it is best not to apply any plaster unless the adhesion be incomplete at any part, and then a very narrow and long strap may be carried from cheek to cheek across the lip.

Caution in giving food. — In giving the child food after the operation, it should be done in such a manner as not to disturb or moisten the lip.

Mode of using pins. — If pins are employed, they are to be introduced at the same part of the lip as the sutures, and then the ligatures are to be twisted over their ends in the figure of an ∞. The pins should be of silver or gold with steel points, which points admit of easy removal: great care is required when taking away the silk and pins, that the adhesions may not be disturbed; this is to be done at the same period after the operation, as when sutures are used.

Fissure in the bone. — A fissure in the bone accompanying that in the lip, makes no difference in the mode of performing the operation, but renders its success more doubtful, from the want of support by bone which the lip would otherwise receive. In general also, in this case, the fissure in the lip extends into the nostril, and it requires great care on the part of the surgeon to produce a union of the upper part of the fissure without deformity.

OF THE DOUBLE HARE-LIP.

Two fissures in the lip. — If there be a fissure on each side extending through the lip, without any imperfection in the bone, the operation is performed in the same manner as when the fissure is confined

to one side, but at successive and distant periods, so as to allow time for the complete adhesion and union of one side, before the second operation be attempted.

Extending through the bone. — A fissure in the bone sometimes accompanies each fissure of the lip, and then a projection of the insulated portion of bone occurs, in some instances almost to the extremity of the nose.

Operation. — The operation may be then performed by removing, or not removing, the projecting bone. I have successfully removed the projecting portion of bone, uniting the lip at a future period; but there was this objection to the mode of relief, that the upper lip did not project as usual from the want of that portion of the jaw and teeth, and an artificial jaw was required to form a support: it is better, therefore, to perform the operation upon each fissure of the lip, by uniting the skin upon each side, to that which remains upon the projecting bone, and to depend upon the modelling process of growth for the gradual diminution of the projection; the operation being the same as that which is necessary for the simple fissure. After the union of the lip, the diminution of the bony projection may be assisted by gentle pressure.

DEFICIENCY OF THE PALATE.

Inconvenience of. — When there is an aperture in the bony palate, the person suffers a twofold inconvenience: 1st, In a nasal pronunciation; 2dly, In the passing of the food, particularly liquid, into the nose.

Two modes of relief. — If the opening be confined to the bony palate, there are two modes of relief, one by the patient's wearing an artificial palate, the other by operation.

Artificial palates.—The most simple of the artificial palates was made for me by Mr Wiess in the Strand, which consisted of two plates of silver connected together in the centres by an axis, so that the one could be turned upon the other by means of a key; thus when introduced, it could be easily fixed. Mr Wiess showed me one of the same form, of elastic gum. A plate of silver, with two springs which passed through its centre, so as to expand when pushed up, would answer the same purpose. The common contrivance is a piece of silver, and a sponge connected to it by a chain or stem; the sponge being passed into the nose through the aperture in the palate, there expands by the moisture, and fixes the silver plate against the opening, but the animal fluids in the sponge soon becme putrescent, and render the breath extremely offensive.

A portion of membrane from the roof of the mouth might be partially pared off, and turned over the opening, its circumference being placed in contact with the edges of the aperture so as to produce adhesion; but of this operation I have not any experience.

For a circular deficiency in the velum palati, an artificial palate of elastic gum will answer best.

Operation for division of the soft palate.—An operation similar to that for hare-lip, has been performed for a congenital division of the soft palate. Mr Cruickshank tried it and failed; Mr Roux of Paris, and Mr Alcock of London, have since been successful.

CANCER LABII.

Its commencement.—This disease wears two different appearances in its commencement. It sometimes assumes the character of a warty excrescence,

at others, it is an ulcerated fissure in the lip attended with surrounding hardness.

At first begins in a wart.—When it is at first a wart it is covered by an incrustation, upon removing which an elevated and ulcerated surface is exposed with surrounding hardness. A fresh incrustation forms, additional growth takes place in some parts, and ulceration in others, until at length a considerable projection is produced. When the incrustation is now removed, the surface freely bleeds, luxuriant granulations appear in some parts and deep depression in others. It extends more upon the red part of the lip than upon the surrounding skin, though ultimately the latter becomes affected. It is very little tender to the touch, so that the patient handles it with great freedom; but it is occasionally accompanied with darting pains.

At first begins as a fissure.—When it begins as an ulcerated fissure in the lip the surrounding part is hard, an incrustation is afterwards produced, and ultimately the disease has very much the same appearance as when it begins as a wart. It gradually ulcerates the skin towards the chin, and although beginning in a small spot at length involves the whole lip.

Character of the sore.—The character of the sore is that of a cancerous ulcer, its edges being everted, and its surface hard; a gland under the jaw next becomes affected between the symphisis and angle, and sometimes the glands on both sides: the gland is hard and at first not painful, then the surface assumes a livid appearance and becomes occasionally acutely painful; at length it ulcerates, discharges a bloody serum, bleeds frequently, the edges of the ulcer are everted, the ulceration becomes extensive, and the surface of the sore very irregular; several other glands in the neck become affected, difficulty

of breathing and of deglutition ensue, and the patient falls a victim to the disease after a long period of suffering.

Its cancerous characters.—Some persons deny that the character of this sore is cancerous, but upon what principle I cannot understand, for it is unequal upon its surface, it has irregular, callous, and everted edges, it is accompanied with lancinating pains, it extends its influence to the neighbouring absorbent glands, and when a section is made of it after its removal its internal appearance is truly scirrhous.

Rare in the upper lip.—I have seen at least two hundred cases of this disease in the under lip, and have only witnessed one in the upper. It is a very rare disease in the female; it is a complaint of age more than of youth, occurring most frequently from fifty to seventy years.

Supposed cause.—A great many of the persons in whom I have seen this disease have attributed it to the custom of smoking, believing that the tobacco pipe was instrumental in its production; but I have frequently seen it in persons in whom it could not be attributed to that cause. It seems to be much more a local disease than cancer in most other parts of the body; the general health often appearing extremely good.

OF ITS TREATMENT.

Escharotics.—In the early stages of this disease the sore may be destroyed by the application of arsenic, which occasions it to slough; it might be also destroyed by the actual cautery, but in the very earliest stages it is most prudent and judicious to remove it by the knife.

Removal by the knife.—The operation should not however be performed if a gland under the jaw be

enlarged, as the disease is then sure to return; but if the gland be not diseased, the result of the operation is much more successful than for scirrhous tubercle in the breast.

Medicine useless. — No local applications short of those that destroy the part, or any form of internal medicines, are found to be useful.

Operation. — The operation is performed in the following manner: An assistant puts a finger into each angle of the mouth, and stretches the under lip to its utmost extent; the surgeon then makes an incision on each side of the disease, so that a triangular portion of the lip is thus removed.

Hæmorrhage. — The coronary arteries bleed freely, but do not require to be secured; but when the inferior labial artery is formed on each side, by a large mental branch, I have found it necessary to secure that vessel at the inferior angle of the incision.

Sutures. — Three ligatures are then required to bring the edges of the wound together; one at the red edge of the lip, and two others at equal distances, in the remaining part of the wound. These are to be passed through the lip by means of a straight needle, as in the operation for hare-lip. Some pressure is afterwards required, to assist in the arrest of the bleeding from the coronary arteries; the patient using a sponge for that purpose.

Two-thirds at least may be thus removed, and yet a good lip be afterwards formed. The ligatures are to be removed on the fourth and fifth days, the upper ligature being left to the fifth day.

It is a folly in this operation not to encroach upon the sound rather than upon the diseased part.

Nature of the morbid change not known. — Of the nature of that change in the nerve which produces this disease I have no knowledge, as I have never had an opportunity of dissecting a nerve which had been affected with it.

Appears to be an action under par. — To me it has always appeared, that it is an action under par, rather than an inflammatory action on the nerve, and for this obvious reason, that the remedies found successful in it are those of a tonic kind: large doses of bark, the free administration of arsenic, but above all, the remedy recommended by Mr Hutchinson of large doses of steel, are the evidences in support of this opinion. — Opium, belladonna, and other narcotics, have only a temporary influence in mitigating suffering. As local applications, I have known belladonna, and an ointment of the subacetate of lead beneficial.

Sometimes originates in the brain. — But this disease sometimes appears to originate in the brain itself, as I have understood was the case in my friend Dr Pemberton, who suffered more from this disease than any individual I have ever witnessed, and in whom a portion of bone was found growing on the brain.*

* In the autumn of last year I was requested to attend a gentleman from Lancashire, on account of his suffering severely from a constant pain on the right side of his face, seated principally in the branches of the second and third divisions of the fifth pair of cerebral nerves. The complaint had existed for several months previously, and the pain was occasionally so acute, that his friends thought he would become insane. He took, at separate periods, mercury, arsenic, steel, bark, sulphate of quinine, opium, and various other narcotics, but without their producing much mitigation of suffering. The vinum colchici

Division of the nerve. — The operation of dividing the nerve for this disease is sometimes anxiously called for by the patient, on account of his agonizing sufferings; I have seen an old weather-beaten captain of a man of war cry like a child under the painful influence of this disease; and a female once said to me, after the division of the nerve, 'Sir, the operating table was a bed of roses in comparison with the agony which the complaint had produced.'

The nerves commonly divided. — The nerves which I have divided, have been the suborbitary, the frontal branches of the ophthalmic, the mental nerve, and the portio dura of the seventh pair, which is perhaps more frequently the seat of this disease than any other nerve in the body.

Operation very simple. — The operation is extremely simple, and is performed in the following manner upon the suborbitary nerve. The ridge at the lower part of the orbit being felt, the foramen

was the only medicine from which he experienced much relief, but it produced so great a derangement of the digestive organs (although taken in conjunction with other remedies,) that it could not be administered but at intervals.

He died in the early part of February last, extremely emaciated, and completely worn out, by the almost constant and severe suffering. His mental faculties appeared perfect to within a few moments of his death, which took place on his making an effort to stand, when assisted out of his bed. On examining his head after death, I found two fungoid tumours originating from the dura mater; one situated on the right side of the sella tursica, and connected with all the branches of the fifth pair of nerves, but particularly the second and third; the other was placed over the cuneiform process of the occipital bone, was of the size of half a large hen's egg, and was connected with the other tumour by a process of the same fungoid matter, which extended over the extremity of the petrous portion of the right temporal bone. The smaller tumour was about the size of a nut. The pons varolii and medulla oblongata, which were much displaced by the diseased mass, appeared softer than natural, at the part immediately over the larger tumour. — T.

through which the nerve passes is situated from a quarter to half an inch below the centre of that ridge. The point of a curved bistoury is then passed into the cheek three quarters of an inch below the ridge of the orbit, and to the outer side of the foramen, and is carried directly to the bone; then passing it upon the surface of the bone under the nerve, and little obliquely upward towards the inner canthus of the eye, the point of the knife is brought to the back of the skin at the distance of an inch from where it entered; it is then kept elevated against the back of the skin as it is withdrawn, and the nerve is thus freely divided by an opening through the skin, not above half the size of that which is made in bleeding.

Pressure with the finger is for a few minutes required, to stop the bleeding from the suborbitary artery.

Division of the frontal branches. — The operation upon the frontal branches of the ophthalmic is performed in a similar manner; as these branches radiate more at the upper part of the orbit, it is necessary to make the division a little more extensively than in the former case.

The eyebrow is drawn up, and the point of the curved bistoury introduced under it on to the ridge of the orbit, to the outer side; and being carried inwards close to the bone towards the upper part of the nose, the point is elevated to the skin, and withdrawn close to the back of it, out of the opening by which it was introduced, by which all the branches are divided.

Division of the mental nerve. — The operation upon the mental nerve is different to the two former; the foramen in the side of the lower jaw, through which this nerve passes, is situated in a line drawn below and between the two bicuspides; and the pain of

the disease of the nerve is felt in the under lip, and the lower part of the side of the face.

In this case, to divide the nerve, the under lip is drawn from the gum, and the point of the curved bistoury is introduced through the skin of the mouth close to the jaw, on the fore part of the foramen, and is then carried backwards close to the bone, dividing the skin of the mouth and the nerve as it passes out of the foramen, the incision being about three quarters of an inch in length; pressure is afterwards required for a short time over the foramen to stop the hæmorrhage from the artery which accompanies the nerve.

Division of the portio dura. — I have only once divided the portio dura of the seventh pair of nerves for this disease. I laid bare the branches of this nerve anteriorly to the parotid gland, carefully avoiding its duct, and passing a director under the nerves, divided many of the branches, paralyzing that side of the face, the mouth being drawn over to the opposite side; a few days after the operation erysipelatous inflammation succeeded, with a very high degree of fever, of which this woman died.

Operation seldom succeeds. — In the various operations which I have performed for this complaint, I recollect but two cases in which the operation completely succeeded.

Affords temporary relief. — For three or four months, the patient is relieved from suffering, but then the disease returns; and it is curious, that it is reproduced whilst the numbness of the lip consequent upon the operation still remains. I have divided the nerve a second and a third time whilst the numbness was remaining in the lip, produced by a preceding operation.

Removal of a portion of the nerve. — It has been said, that removing a portion of the nerve prevents

the pain from returning; but a person who had submitted to this operation informed me, that he had caustic applied upon the extremities of the divided nerve, yet he consulted me for the returning disease.

With respect to the operation for the disease, it ought to be performed rather at the earnest desire of the patient than by recommendation of the surgeon.

AURA EPILEPTICA.

Case. — For this disease, I have only once had occasion to perform an operation. The case was sent to Guy's Hospital by Mr Masters, surgeon at Watford. The man had received a severe blow on his thumb, after which he had the following symptoms, which had lasted for several months: uneasiness in the parts; pain extending up the arm in the course of the radial nerve; also to that side of the neck, accompanied by a rotatory motion of the arm inwards; occasional loss of sense and volition, so as to occasion him to fall, but without any struggle; he remained insensible for a few minutes and then recovered, excepting that the attack left some pain in his head. As the man had recourse ineffectually to a great variety of internal remedies and to electricity, I recommended him to submit to the division of the nerve, and making an incision upon the outer side of the radius, opposite to the insertion of the supinator radii longus, I laid bare the nerve, and putting a director under it, I removed a portion, which measured, after its removal, five eighths of an inch. The man had some slight attacks of the complaint afterwards, but on his return to Watford Mr Masters informed me that he entirely recovered.

LECTURE XXX.

ON AMPUTATION.

Less frequent than formerly. — The removal of constituent parts of the body becomes necessary from different causes, but such operations are much less frequently performed at present than they were thirty years ago.

Improved treatment of compound fractures and dislocations. — The improved treatment of compound fractures renders it rarely necessary to amputate a limb for those accidents. A compound dislocation of a large joint, a few years back, led the surgeon to condemn the limb to amputation, but it is now no longer generally believed to require it. There will, however, be cases in which an operation will be occasionally required for one of these accidents.

Of aneurisms and diseases of joints. — An aneurism in a limb, for which, forty years ago, amputation of the limb was frequently performed, is now, by the simple operation invented by Mr Hunter, readily and effectually cured. The simple chronic and scrofulous enlargements of joints were formerly often deemed to require the operation of amputation, but rest, external irritation, alterative medicines, and a nutritious diet, now generally do away with the necessity of having recourse to so direful an expedient.

Of ulcers and diseased bone. — Extensive ulceration of a limb is now much more frequently cured than formerly. The treatment of the diseases of bones

is much better understood, and the result, although tedious, is rarely unsuccessful.

Natural separation of parts. — In gangrene, considerable portions of the feet, or of other parts, will separate by the efforts of nature, often producing as perfect a cure as the surgeon is able to effect by operation.

Operation sometimes necessary. — Amputation will still be occasionally necessary for the accidents and diseases I have mentioned: for laceration of limbs from machines; for the effects produced by the bursting of fire-arms; for some cases of gun-shot wounds; for chronic and scrofulous complaints, and for malignant diseases of a cancerous or fungoid nature; also for deformities which are either congenital or the result of organic change, and for exuberant growths, as tumours.

All that I wish to advance upon the subject is, that although the necessity for this operation still exists, that the number of amputations thirty years ago was much greater than of those of the present day.

Much less dangerous than formerly. — Amputation is not only much less frequent than formerly, but it is an operation of infinitely less danger. The extensive surface of wound left after the old operation, and filling the wound with charpie or flour, led to the highest degree of constitutional irritation; whilst now, the integument being brought over the wounded surface, directly produces a process of adhesion, by which the constitutional disturbance becomes lessened and the danger from the operation greatly diminished.

I shall now proceed to describe the various amputations which are required at different parts of the limbs.

The common amputating instruments are so well

known, that I need not enter into any particular description of them, but I shall mention those proper to be used in each operation, when I give an account of the mode of performing it.

Application of the tourniquet.—Of the various tourniquets, I prefer that of Petit, which is generally employed at the Borough Hospitals. In applying this tourniquet, the pad should be placed immediately under the plate to which the screw is fixed, by which the screw is made to act more effectually on the pad. That part of the limb upon which the tourniquet is to be placed should be first surrounded by a piece of soft linen to prevent the tape, when tightened, from cutting the integument. In the thigh it should be placed a little above the middle, where the artery passes nearest to the bone; and in the arm, one-third of the length of the os humeri from its head on the inner side the biceps.

Artery compressed without the aid of a tourniquet.—When amputation is required at the upper part of the thigh, the termination of the external iliac artery in the femoral is to be compressed upon the edge of the pubes, by an assistant, who puts one of his thumbs over the vessel, and the other thumb upon the first, which is our usual mode. If the amputation be performed high in the arm, the assistant is either to press the axillary artery with his fingers against the head of the os humeri, or else the subclavian upon the first rib, by means of the ring of a key or a pad, passed behind the clavicle.

OF AMPUTATION OF THE FINGERS.

In removing a portion of a finger at the second or third joints, the operation is, I think, best performed in the following manner:

Instrument.—The only instrument required is a common pointed scalpel.

Operation. — The finger being extended, the integument is cut through by a circular incision about half an inch beyond the joint, and a lateral incision is to be made on each side in the direction of the lateral ligaments, extending from over the joint to the circular cut; the portions of integument are to be raised from the flexor and extensor tendons below and above as far as the joint, making two flaps; after which the tendons and one of the lateral ligaments are to be divided, when the joint may be easily dislocated, and the separation of the part readily completed.

Vessels. — The vessels divided in this operation seldom require the application of a ligature, the pressure from the dressings being usually sufficient to prevent any hæmorrhage.

Dressings. — The flaps of the integument should be brought together, and kept so, by a narrow slip or two of adhesive plaster passed over the extremity from the dorsal to the palmar part, and these strips should be secured by a circular portion a little above the stump. The hand and fore-arm should be supported by a sling until the stump has healed.

Another mode of operating. — The operation of amputation may be performed at either of these joints, by making a single flap from the palmar part. In doing this the joint must be flexed, when the scalpel is carried through the integument on the dorsum of the joint, and through the joint itself, dividing the ligaments at one cut; the knife is then passed under the phalanx, which is to be amputated, and a flap of sufficient extent is separated from the palmar side.

Not always practicable. — This mode of amputating is more expeditious than that first described, but it is not applicable to those cases in which the finger is straight and the joint stiffened from disease, as the knife cannot be then introduced into the joint from

the back part; there is also much difficulty in separating the flap without including part of the flexor tendons; and, upon the whole, the union of the divided parts is not so easily accomplished.

Applicable to the toes. — These operations are equally applicable to the same joints of the toes.

Amputation of a whole finger. — When it is necessary to remove the whole of a finger, I think it better to saw off the extremity of the metacarpal bone, rather than to open the joint. If the middle or ring finger be thus removed, less deformity results from the operation, as the remaining fingers approximate much more than when the extremity of the metacarpal bone is left; if the fore or little fingers are amputated in this manner, an ugly projection is prevented, which would not be of any utility if suffered to remain. The wound also unites more readily, than that which is produced by the amputation through the joint.

Instruments. — The instruments required in performing this operation are, a common pointed scalpel, and a metacarpal saw;* and my metacarpal saw moves upon its axis, so that it can be made to cut in any direction.

Operation. — The finger to be amputated being extended and separated from the others, two incisions are to be made through the integument, which meet at an angle over the dorsum of the metacarpal bone, at a short distance below the digital extremity, and terminate on each side of the first phalanx at the natural separation of the fingers; two other incisions of the same form and extent are to be made on the palmar side, which are to join the former between

* In amputating part of a metacarpal or metatarsal bone, I always use a chain saw, which I find much more convenient than the common metacarpal saw, being employed with greater facility and cutting more rapidly. — T.

the fingers; the scalpel is then to be passed down on each side of the extremity of the metacarpal bone, so as to divide it completely from its lateral connexions, and the extensor and flexor tendons are also to be cut through at the point of the first incisions; this being accomplished, the blade of the metacarpal saw is to be introduced between the bones, and the extremity to be removed is to be carefully sawn off.

Dressing. — The edges of the wound are to be brought into contact, by binding the fingers on each side of it together, when the hand and fore-arm are to be supported by a sling, as after the former operation.

Operation of the fore or little finger. — In amputating either the fore or little finger, only two external incisions are required, which should begin at a point below the extremity of the metacarpal bone, as in the other case, only over the centre of that side which is outermost, and extend one over the joint and the other under it in an oblique direction, so as to meet between the fingers; two flaps are then to be raised, so as to expose the extremity of the metacarpal bone; the separation of which is to be completed as before described. The edges of the wound are to be brought into contact by the application of adhesive plaster, and the arm to be supported.

Application of ligatures to the vessels. — If the vessels which are divided in any of these amputations afford a troublesome hæmorrhage, which cannot be readily checked by pressure, it will be proper to secure such vessels by ligatures, before the edges of the wound are finally approximated; and after any amputation, when a ligature has been applied upon an artery, one of the ends of the silk should be cut off a little beyond the knot on the vessels, as it is

perfectly useless, and, if allowed to remain, only tends to increase irritation.

Toes to be amputated at the joints.—When it becomes necessary to remove any of the toes, they should be amputated at the joint in preference to separating the extremity of the metatarsal bone; because it is desirable to preserve the width of the foot and support of the body, which would be diminished by the removal of part of the metatarsal bone.

Operation nearly the same as before mentioned.—The operation may be performed in the same way as that last described for the removal of the fingers, excepting that the incisions should not reach beyond the joint, which should be opened from the side, as in the amputations at the second and third joints.

After-treatment.—After any of these operations upon the toes, the patient should observe the recumbent posture, until union of the edges of the wound has been effected.

Amputation through the metacarpus or metatarsus.—Amputation should be performed through the metacarpal or metatarsal bones, when all the finger or toes are so much injured as to require removal; it is much better than amputating through the carpal or tarsal bones, as, in the hand, the patient afterwards derives great advantage from the use of the carpus, which is thus preserved, and, in the foot, the insertions of the tibialis anticus, with those of the peroneus longus and brevis being uninjured, the remaining part of the foot is much more useful, than when the metatarsal bones are entirely removed: in either case the wound unites sooner than when the articulations are exposed.

Portions of the hand removed.—In some cases, if the injury or disease does not extend to all the metacarpal or metatarsal bones, only such as are injured or

diseased should be amputated. Thus, in the hand, the thumb with its metacarpal bone alone may be removed, or all the fingers with their metacarpal bones may be amputated, the thumb being allowed to remain; the middle and ring fingers, the ring and little fingers; or the middle, ring, and little fingers with their metacarpal bones, may, in like manner, be separated from the others.

Of the foot.—In the foot, the great toe and its metatarsal bone may be amputated from the others, or the others from it; or the second and third, the third and fourth, the fourth and fifth; or the third, fourth, and fifth may be removed together with their metatarsal bones.

Case.—In one instance I removed the middle and ring fingers with their metacarpal bones; approximating the fore and little fingers, which were not injured, by bandage. The patient recovered quickly, having perfect use of the remaining portion of the extremity.

Case.—I also, in another patient, amputated the thumb and the three inner fingers with their metacarpal bones, leaving only the fore finger, which was infinitely more useful than any artificial hook could have been.

Cases.—The metatarsal bone of the great toe I have several times had occasion to remove; and Mr Key has amputated, the four smaller toes, with their metatarsal bones, the two outer cuneiform, and the os cuboides, successfully; leaving the os calcis, astragalas, navicular and internal cuneiform bones of the tarsus, with the metatarsal bone of the great toe and the toe itself.*

* I have amputated through the metacarpal bones of the fingers, leaving only the thumb; and in another patient I removed the three inner fingers, with half of the metacarpal bone of the middle, and the whole of those of the ring and little fingers, to-

Instruments. — The only instrument required is the catling.

Application of the tourniquet. — Before commencing the operation, the tourniquet should be applied on the upper arm.

Operation. — The patient being seated in a chair, the surgeon first makes a circular incision through the integument, just over the bases of the metacarpal bones, which should include more of the integument upon the back of the hand than towards the palm; he then dissects the skin back as far as the styloid process of the radius; the integument is held back by an assistant, whilst the surgeon takes hold of the hand he is about to remove; and, feeling for the extremity of the styloid process of the radius, he passes the catling into the joint between the radius and scaphoid bone, by dividing the external lateral ligament; and he completes the amputation by carrying the knife through to the inner side of the carpal joint.

Vessels. — It will be necessary before dressing the stump to secure the ulna and radial arteries by ligatures.

Dressing. — The edges of the integument are to be brought together over the extremity, and retained in contact by means of straps of adhesive plaster,* passed from over the flexor to over the extensor

gether with the unciform and orbicular bones of the carpus Both cases succeeded. — T.

* I prefer the plaster I have before recommended, composed of equal parts of the empl: thuris comp: and empl: saponis, to the common adhesive plaster, on account of the tendency of the latter to create irritation.

muscles, and these straps are to be confined by a circular piece, after which the arm is to be supported in a sling, or upon a pillow if the patient be confined to bed.

Amputation between the second and third row. — I have known the hand amputated between the first and second row of the carpal bones, but I think it objectionable on account of the number of joints which are exposed.

OF AMPUTATION THROUGH THE FORE-ARM.

Instruments. — The necessary instruments are, the catling and the saw.

Position. — The patient is to be seated, and the tourniquet applied as in the former operation.*

Operation. — The limb being extended, the surgeon commences the operation, by making a circular incision through the integument sufficiently high to avoid the numerous tendons at the lower part of the fore-arm; then he separates the integument from the subjacent parts, and turns them back to the extent of about an inch and a half; an assistant keeps this supported whilst the surgeon cuts through the superficial muscles by another circular incision, and allowing a short time for their retraction, he divides the deep-seated layer, and exposes the bones, from which he carefully separates the muscles and interosseous ligament, by passing the catling between and around the ulna and radius at the part on which he intends to apply the saw. The fore-arm is then

* If the integument of a limb be covered with hair, the patient will be saved much suffering by having that part, on which the plaster will be applied, shaved, before the commencement of the operation; otherwise when the plaster is removed, these hairs are drawn out with it, rendering the separation of the dressing extremely painful. — T.

held in such a position that the surgeon can easily saw through both bones at once, in doing which he should make use of the whole of the cutting edge of the instrument, and employ very little pressure, as the weight of the saw itself is almost sufficient. If the ends of the bones have any sharp points projecting from them which will sometimes happen if they have not been cleanly sawn through, these points should be carefully taken off by the bone nippers.

Vessels.—After this amputation four vessels will generally require to be secured; viz, the ulna, radial, and two interosseal arteries.

Dressing.—The wounds should be dressed as that after the amputation through the carpus, and the same treatment adopted.

Two flaps.—This amputation may be performed by making two flaps, one formed from the posterior, and the other from the anterior part of the fore-arm.

Danger of amputating low down.—I have seen two cases in which inflammation and sloughing of the tendons have followed amputation performed through the lower part of the fore-arm a little above the carpus; they both proved fatal. It is better therefore to avoid operating at this part, as litle advantage is gained by leaving more of the bones, and the risk is greatly increased.

OF AMPUTATION THROUGH THE UPPER ARM.

Instruments.—The same instruments as used in the last operation are all required.

Position.—The tourniquet should be applied sufficiently high to allow of ample space for the performance of the amputation, and the patient should be seated in a low chair.

Operation. — An assistant extends the arm, and the surgeon first drawing up the integument with his left hand so as to put it on the stretch, divides it by a circular cut with the catling about one inch and a half above the olecranon; he then raises it from the parts beneath to the extent of about two inches, according to the size of the limb, and turning it back, he, by another circular cut, carried close to the reflected integument, divides the superficial muscles, and subsequently the deep-seated muscles down to the periosteum, and he finishes with the knife by cutting through the periosteum at the part on which he is to apply the saw. The integument and muscles being carefully held back, the saw is applied and the bone divided, when the amputation is completed.

Vessels.—Three arteries will generally require the application of ligatures, viz, the brachial, profunda, and ramus anastomoticus.

Dressing. — The edges of the integument are to be brought together by the application of adhesive plaster, and the patient being placed in bed on his back, the stump is to be supported on a pillow, so as to be rather higher than the shoulder.

Application of a roller. — If the skin be loose or the muscles flabby, a roller should be put around the limb to give support to these parts, before the patient be placed in bed.

It may be necessary in some cases to amputate higher up than I have mentioned, but the steps of the operation will be otherwise the same.

OF AMPUTATION AT THE SHOULDER JOINT.

Instruments. — The only instrument required is a catling.

Subclavian artery compressed. — The subclavian artery is to be compressed upon the first rib, from

above the clavicle, by an assistant. The ring of a common key covered with some soft linen is a convenient instrument for this purpose.

The patient should be seated on a low chair, and the arm, to be removed, should be elevated a little from the side by an assistant.

Two modes of operating. — The operation may be performed by making a single flap or two flaps; I prefer the former, but in some cases, on account of disease extending so as to prevent the formation of a single flap, the latter mode should be adopted.

Operation with a single flap. — In making the single flap, the surgeon raises the deltoid muscle with the fingers and thumb of his left hand, and introducing the catling through the integument, and under the muscle near to its insertion, he cuts upwards close to os humeri as far as the under part of the acromion process; the integument and larger part of the deltoid muscle are thus raised, so as completely to expose the outer part of the shoulder joint; the arm being then drawn downwards, the catling is passed into the joint at the anterior part, so as to divide the tendon of the biceps muscle, and afterwards is carried round the head of the bone to cut through the capsular ligament: the separation of the limb may be completed either by passing the knife over the head of the bone, and cutting downwards to the axilla, or by placing the knife in the axilla and dividing upwards to the joint; in either case the amputation should be finished by one stroke of the catling.

Vessels. — The axillary artery is to be immediately secured by a ligature, and small branches from the circumflex arteries may be required to be tied.

Operation with two flaps. — When two flaps are required, the first incision extends from just below the point of the acromion downwards, and back-

wards into the axilla, being curved a little forwards and passing below the insertion of the latissimus dorsi muscle; the back flap is then raised, dividing at the same time part of the deltoid, and the insertion of the latissimus dorsi; the anterior incision through the integument is begun from the same point as the posterior, but carried downwards and forwards below the insertion of the pectoralis major, into the axilla, so as to meet the termination of the first incision; this flap is then raised in part, to expose the capsular ligament, which is to be divided, together with the tendon of the biceps muscle as in the former operation; after which, the head of the bone being dislocated, and the flaps being held back, the catling is passed behind the bone, and the amputation is completed by dividing the remaining portion of the interior flap together with the axillary vessels, nerves, &c. The artery is to be secured as before mentioned.

Dressing.—After either mode of amputating, the straps of adhesive plaster, employed to keep the edges of the wound in contact, are best applied from before to behind, and should be of sufficient length to keep a firm hold.

Operation successful.—In every instance in which I have performed the amputation through this joint, and every case in which I have seen it done, the recovery of the patient has been speedy and perfect.

OF AMPUTATION BETWEEN THE TARSUS AND METATARSUS.

Instruments.—As I think it best to saw off that part of the internal cuneiform bone, which supports the metatarsal bone of the great toe, a saw will be required, as well as a strong catling.

Position.—A tourniquet should be applied upon

the thigh, and the patient should be placed upon a low table in the recumbent posture.

Operation. — The leg and foot being extended, and fixed by an assistant, the surgeon divides the integument across the dorsum of the foot, commencing at the base of the metatarsal bone of the great toe, and terminating the incision about half an inch beyond that of the little toe; he then makes a lateral incision on each side, so as to enable him easily to dissect up the flap of integument as far as the joints of the four smaller metatarsal bones, and that part of the internal cuneiform which is on a level with these articulations; the extensor tendons being next divided, the four small metatarsal bones are bent downwards, and their ligamentous connexions with the tarsal bones cut through with the point of the catling, after which, the internal cuneiform bone is sawn through even with the other tarsal bones: the amputation is completed by passing the catling between the separated bones, dividing the flexor tendons, &c, and forming a flap of about equal size to the superior from the integument on the sole of the foot.

Vessels. — The anterior tibial on the dorsum pedis, and the two plantar arteries of the sole, will most probably require the application of ligatures.

Dressing. — The integument is to be brought over the extremities of the bones, and the edges of the wound kept in contact by straps of adhesive plaster, passed from the sole to the dorsum; the patient is to be placed in bed, and the foot supported by a pillow, until union has taken place.

A single flap may be made. — Sometimes a single flap may be made from the dorsum, or sole of the foot, but it does not unite so readily as the double flap.

OF AMPUTATION THROUGH THE TARSUS.

Instrument. — A catling only is necessary in performing this operation.

Position. — The torniquet must be applied, and the patient placed as in the former case.

In this operation, the navicular bone is to be separated from the astragalus, and the os cuboides from the calcis.

Operation. — The surgeon, having felt for the projecting point of the navicular bone on the inner side of the foot, cuts through the integument about three quarters of an inch beyond it, straight across the dorsum of the foot, and having made two small lateral incisions, he dissects back the upper flap, and divides the extensor tendons over the articulations, which he then opens, first, by cutting through the lateral ligaments on the inner side, uniting the navicular bone to the astragalus, then the ligament on the dorsum connecting the same bones, and afterwards the ligaments between the os cuboides and calcis, above and externally; the knife being then passed down between the articulations, the inferior ligaments with the flexor tendons and muscles in the sole are divided, and the operation concluded by making an inferior flap of the integument equal to the superior.

Vessels. — The same arteries require to be secured as after the former operation, and the dressing and after position of the patient are to be similar.

Not a successful operation. — From a comparative result of this operation, with that of sawing through the tarsal bones, I am certain the latter produces less irritation and danger than the former.

OF AMPUTATION OF THE LEG BELOW KNEE.

Various modes of operating. — This operation may be performed with a circular incision, and with a single or double flap. I prefer the first, but cases may present themselves, in which it may be proper to adopt either of the other modes.

Instruments. — In performing the operation with a circular incision, a small amputating knife is usually employed in completing the first step; but a catling is necessary to divide the soft parts between the tibia and fibula; and this, if rather larger than usual, does equally well in the commencement. A saw is also required.

Position. — The patient is to be placed in a recumbent position, on a table, and the tourniquet is to be applied upon the thigh.

Operation. — One assistant holds the leg, and supports it at a convenient height; another assistant grasps the leg just below the knee and keeps the integument stretched by drawing it towards the thigh, when the surgeon commences his first incision over the anterior part of the tibia, about six inches below the patella, and carrying the knife round the limb, he at one sweep divides the integument, terminating the incision at the point from which he commenced; he next separates the integument from the subjacent parts to the extent of two inches or more, and turns it up, in which position it is retained by an assistant, whilst the surgeon cuts through the superficial muscles, close to the reflected integument; and having allowed these to retract, he divides the deep-seated with the interosseus ligament and the periosteum by passing the catling between and around the bones. The knee being then turned inwards, the saw is applied first upon the tibia, and when this bone has

been in part divided, the saw is made to act upon the fibula also, so that the amputation is finished by sawing through the remaining portion of the tibia and the fibula together.

OF AMPUTATION WITH A SINGLE FLAP BELOW KNEE.

May be performed in two places. — This operation may be performed as low down as is possible without interfering with the Tendo Achillis, when the patient is desirous of afterwards wearing an artificial leg made of cork, instead of the common wooden one; otherwise the bone should be sawn off at the same point, as when the circular incision is made.

Instruments. — A long catling and a saw will be required.

Operation. — The position of the patient, and of the limb, being as when the circular operation is performed, the surgeon feels for the posterior edges of the tibia and fibula, over one of which he places the thumb, and over the other the fore finger of his left hand, the palm resting upon the anterior part of the limb; the extremity of the catling is then introduced immediately below one of these points, and steadily thrust through the calf of the leg, until it protrudes just below the other point, when the blade is carried downwards, so as to form a flap of sufficient size, from the muscles and integument posteriorly; the next step of the operation is, to divide the integument anteriorly, by making an incision commencing at the place at which the catling was thrust in, passing over the fore part of the leg, and terminating at the spot from which the catling was pushed out: the amputation is completed after this, in the same manner as in the common operation.

Operation with a double flap. — A double flap is

sometimes made from the outer and inner sides of the limb, when the surgeon commences the operation by an incision on the outer part of the leg, reaching from the anterior edge of the tibia to the back of the calf; and having a semicircular form with the convexity toward the malcolus externus, he then dissects back the flap of integument, and afterwards makes a corresponding flap on the inner side, commencing and terminating as the former. The flaps being held back by an assistant, the operation is finished in the usual manner.

Vessels. — After either of these amputations three vessels will have to be secured, viz, the anterior tibial, the posterior tibial, and sometimes the peroneal.

Dressing. — It is best in either case to place the straps of adhesive plaster, when dressing the stump, from side to side, rather than from above to below, as, by this, pressure is avoided upon the anterior edge of the tibia, which might otherwise produce much irritation and ulceration.

After-position. — The patient should be placed upon his back in bed, and the thigh being flexed towards the abdomen, a pillow should be put under the ham, and the stump be allowed to hang over it. The limb should be inclined a little to the outer side.

Objections to a single flap. — The objections to the operation with a single flap are, that the wound does not unite so readily as that made by a circular incision; and if after-hæmorrhage occurs, which renders it necessary to open the stump, there is a greater difficulty in securing the bleeding vessels; and in debilitated persons, the disturbance of the adhesions is likely to produce a slough of the flap. The anterior edge of the tibia being also more exposed is more likely to exfoliate, and the subsequent contraction of the flap makes the union tedious.

Sometimes necessary. — When, however, the integument upon the anterior part of the leg has been destroyed, the formation of a single flap from the posterior part becomes absolutely necessary.

OF AMPUTATION ABOVE THE KNEE.

Instruments. — A large amputating knife and a saw will be required.

Position. — The patient is to be placed upon a table on his back, and the tourniquet is to be applied high enough upon the thigh to allow of ample room for the retraction of the integument and muscles.

Operation. — One assistant supports the leg, and another draws up the integument on the upper part of the thigh. The surgeon first cuts through the integument surrounding the limb about one inch and a half above the patella, to avoid the bursa of the rectus, beginning on the superior part over the rectus, and passing the knife round with one sweep to terminate at the same point; he then dissects up the integument for about three inches, and this is kept reflected by an assistant whilst the superficial muscles are divided by another circular cut close to it; the assistant holding the integument then draws it upwards to assist the retraction of these muscles, after which the deep-seated muscles and the periosteum are cut through so as to expose the bone, which is lastly to be sawn through.

Vessels. — The following vessels will require the application of ligatures: the femoral branches of the profunda, and sometimes the sciatic.

Dressing. — The integument is to be brought over the end of the stump from side to side, and confined by straps of adhesive plaster, after which the patient is to be placed upon his back in bed, and a pil-

low should be put under the upper part of the thigh so as to elevate the stump.

OF AMPUTATION AT THE HIP JOINT.

Femoral artery to be secured first. — In this amputation it is decidedly the safest plan to secure the femoral artery by a ligature at Poupart's ligament, as the first step of the operation.

Mode of doing it. — An incision is begun two inches above the middle of Poupart's ligament and is extended two inches below it: the femoral artery is to be laid bare, and the ligature introduced at the centre of the incision is to be tied upon the denuded vessel opposite Poupart's ligament, and above the arteria profunda.

Operation. — A long catling is then used to make the inner incision through the integument and muscles. This incision is to be begun at the lower part of that which was made to expose the artery, and it is to be carried from thence on the inner side of the thigh obliquely downwards, and is then continued on the outer side of the thigh below the trochanter major to the point at which it began; in this way a larger portion of integument is left to form a covering to the stump than would be produced by a circular incision without obliquity.

In the same line a second incision is to be made to divide the muscles, but the edge of the knife is to be inclined obliquely upwards towards the joint, and the integument and muscles being drawn back, those of the latter which are inserted into the trochanter major should be cut through.

A third incision is to be made to divide the psoas and iliacus internus muscles and the forepart of the capsular ligament, when the knee being pushed backwards and outwards the head of the bone is dislocated

as far as the ligamentum teres will permit; this being divided, the head of the bone turns completely out of the acetabulum forwards.

A last incision is made by passing the knife over the head of the bone, and behind it, so as to cut through the remaining muscles, &c.

Not the quickest mode.—I am ready to acknowledge that this is not the quickest mode of removing the limb; but securing the artery in the first instance prevents a patient, who is much reduced, from eventually sinking in consequence of the loss of a very considerable quantity of blood.

Vessels.—When the limb has been removed, branches of the obturator, ischiatic, and gluteal arteries will require to be secured. The sides of the wound are to be brought together, and, if they easily meet, by adhesive plaster only; but if there be any difficulty in their coalescence, it is best to employ a suture.

The same after-treatment is necessary as after other amputations.

Preferable to saw through the trochanter.—I am, however, of opinion, that in every case in which the amputation can be performed by sawing through the thigh bone below the attachment of the capsular ligament, that it should be done in preference to opening the joint and removing the head of the bone from its socket.

Case.—I have only once amputated at the hip-joint, and the patient recovered, but only after excessive suppuration from the acetabulum, sloughing of portions of the cartilage, and continuance of suffering and fever, exposing him to great risk, which would have been greatly lessened had it been possible from the state of the bone to have sawn through the os femoris at the trochanter.

Removal of the dressings.—The removal of the

dressing for the first time after an amputation must depend in a great measure upon the feelings of the patient as regards the stump, and from the appearance of the discharge.

On the sixth or seventh day. — If the patient does not experience any unusual pain in the stump, the plasters should not be disturbed for six or seven days, by which time the adhesion of the edges of the wound will have become sufficiently firm to prevent any risk from the removing the dressings, provided it be done carefully.

Part cut away. — Should the patient experience shooting pain in the stump, and have other symptoms of suppurative inflammation, some portion of the plaster should be cut away from the lower part of the wound, in order to allow of the escape of any matter that may form, and a light poultice should be applied.

Plasters snipped. — When a tightness is felt at any part of the stump from the pressure of the plaster, the surgeon should snip some of the straps on the side, which will generally relieve the pressure.

Mode of removing the plaster. — When the stump is dressed, the straps of plaster should be taken off one by one, and care is required not to disturb the ligatures; if union of the wound be not complete, some fresh straps should be applied as the old ones are removed, by which mode separation of the edges of the wound may be greatly prevented.

Sometimes to be removed early. — Should the first dressings become much loosened, or the stump be excessively painful, the plasters must be removed earlier than I have mentioned.

Separation of ligatures. — If the ligatures do not come away by the fourteenth day after the operation, the surgeon should gently draw each thread when he dresses the wound, in order to expedite their separation.

APPENDIX.

ON THE

AREOLAR, OR MAMMILLARY TUMOUR.

By SIR ASTLEY COOPER, Bart.

Age at which it occurs.— At the age of seven years, and from that period until puberty, children are not unfrequently subject to the swelling behind the nipple, or mammillæ of the breast. This swelling occupies a circle of an inch or more, involving the posterior part of the nipple.

Symptoms.— The child, feeling uneasiness in the part, is led to examine it with attention, and then finds a swelling, which is generally tender to the touch, and is sometimes, though not commonly, acutely sensitive. The skin over it is undiscoloured; it moves freely upon the pectoral muscle; but the nipple moves with it. I have seen it frequently, both in boys and girls; but I think more frequently in the male than in the female. It generally affects only one breast; but sometimes, though rarely, it exists in both. It does not appear to accompany a scrofulous disposition, but is found in irritable young persons. The age at which it has most frequently presented itself to my observation, has been from eight to twelve years.

Within this period, then, a surgeon will be sometimes called upon to remedy a hard circular sensitive tumour behind the nipple and areola. Its cause I shall presently proceed to explain, when existing at this period of life.

Not productive of serious mischief.— I have never seen it productive of any serious disease. Sometimes, however, it endures for several months, if attention be not paid to the means for its removal.

Treatment.— The best mode of treatment consists in the application of the emplastrum ammoniaci cum hydrargyro, and in giving small doses either of the hydrargyrus cum cretâ, with rhubarb, or of the oxymurias hydrargyri, with bark or sarsaparilla; under the influence of which remedies, it generally becomes gradually absorbed in the space of from two to three months. It sometimes yields to evaporating lotions.

Disease in the adult.— The same part which it affected posterior to the nipple, in earlier periods of life, becomes the seat of more serious disease in after age. For the structure, which I am presently to describe, is liable, particularly in the male, to be affected with the two malignant diseases to which the body is subject, namely, to the scirrhous affection, or to the fungous.

OF THE SCIRRHUS OF THE MAMMILLA.

Symptoms.— This disease begins with a circular swelling at the root of the nipple. It is at first free from pain, but is excessively hard, and is somewhat irregular upon its surface. It gradually increases in size, and during its growth a shooting, darting, and occasionally a lancinating pain strikes through the swelling, and to the shoulder, in the course of the mammary nerves.

Ulceration.— A slight ulceration next supervenes upon the surface of the nipple, which is succeeded by a yellowish brown incrustation. When the first incrustation is separated, it is succeeded by another, and a deeper ulceration ensues, by which process the nipple of the breast is gradually removed, and the scirrhous substance is exposed. Whilst the ulceration is proceeding in the centre, the scirrhous increases in circumference, until it occupies a considerable circle round the nipple, and as the bulk of the disease augments, the pain with which it is accompanied is likewise aggravated; yet the diseased part is only in a slight degree tender to the touch, and the patient is often seen to handle it in an unfeeling manner.

Bleeding.— The discharge from it, which had previously formed an incrustation, now increases and becomes fluid, and the sore frequently bleeds.

Glands affected.— The glands in the axilla become enlarged and hardened, after a long continuance of the complaint. The patient's lungs become diseased, and water is effused into the cavity of the chest. I have seen several males, and one or two

females die of this complaint; and I have given a view of the appearance which the swelling assumes on dissection.

Removal necessary. — As this disease is beyond the control of medicine, for none that I have ever known recommended, or seen employed, seems to have the least influence in preventing its destructive effect, its removal must necessarily be effected either by the knife or by the application of arsenic. The former mode is vastly preferable to the latter; it is upon the whole less painful in the execution, and it is of more certain efficacy in completely removing the disease. Arsenic, on the contrary, often but partially removes the complaint: and the irritation which it excites extends the disease to the neighbouring absorbent glands. The absorption of the mineral, also, sometimes produces serious effects upon the constitution. When the disease is clearly and completely removed by the knife, the edges of the wound are brought together, and they readily unite by adhesion.

Treatment if an operation cannot be performed. — If the disease has been neglected, if extensive ulceration has ensued, and the complaint has proceeded beyond the relief which is to be derived from surgical operation, the applications which I have seen most advantageous in tranquillizing the sore, and improving its appearance, have been chalk and opium, in the proportion of an ounce of the former to a drachm of the latter; oxyde of zinc and opium in the same proportions; or oxyde of bismuth with opium. These means, however, only retard the progress of the disease, rendering the descent to the grave a little more easy and a little less rapid, but they do not prevent the fatal termination of the complaint.

OF THE FUNGOUS TUMOUR OF THE MAMMILLA.

Symptoms. — Of the fungous tumour of this part I have seen three different instances, each of which existed in the male, and each was removed.

The tumours began behind the nipple, which adhered firmly to their surfaces. They were globular, and did not possess the hardness of true scirrhus, but felt at first more like simple chronic tumours, and grew less firm as they increased. They were but slightly tender when pressed, and entirely free from pain. They neither of them had ulcerated. After they had existed for several months they began to increase rapidly, and this circumstance excited alarm in the minds of the patients, so as to lead them to make application for surgical assistance. The medicines which I advised, and the applications which I proposed, appearing to

have no influence in preventing the progress of the disease, I recommended extirpation. Two of the patients recovered without any returning disease; the third, after a few months, sunk under what was believed to be hepatic disorder.

More spongy than scirrhous. — I have given a plate of the appearance of one of these tumours; it is much more spongy than the true scirrhus. The vessels which it possesses are more numerous, and their diameters larger, more especially of the veins. It not only adheres to the nipple, but it proceeds from its basis. The vessels which supply it are of considerable size, and require to be carefully secured to prevent after-hæmorrhage. In neither of the cases had it contracted adhesion to the pectoral muscle; and there was therefore no difficulty in detaching it from the surrounding parts.

ON THE SEAT OF THESE DISEASES.

Having thus described the diseases which are placed at the basis of the nipple, I shall now proceed to point out the structure in which these complaints begin; and which the plates connected with the work will very clearly explain.

Discharge of fluid from the nipple of the infant. — A child born at the full period of gestation, whether it be male or female, is found to have, issuing from its nipple, a fluid of milky appearance, which, when alcohol is poured upon it, deposits a solid, which has the appearance of coagulated albumen. This fluid the nurses are in the habit of pressing out; as they pretend that it is liable to excite inflammation if suffered to remain. Whether this be the case or not, or whether the inflammation which sometimes ensues be the result of pressure and friction which the nurses employ, I am not able to state; but inflammation does sometimes ensue, and require fomentation for its relief.

Structure of the part. — Thirty-two years ago I first learned there was such a discharge from the nipple; and was led to examine whence it proceeded; when, upon making a section through the middle of the nipple towards the ribs, I found a circular glandular structure, larger than a large pea, and situated directly behind the nipple. It is of a red colour, from its extreme vascularity. It contains ducts which open at the nipple; and from these may be pressed, first a milky fluid, afterwards a sebaceous matter. The nipple over it is situated in a depression, and appears red and granular in many subjects. The artery which supplies the gland is derived from the axillary; and the branches derived from, and distributed to the gland are numerous. Veins return the blood in the course of the arteries; and filaments of nerves from the axillary plexus are distributed to it.

Mode of exhibiting it. — All that is necessary to do, in order to observe this structure, is to make an incision through the centre of the nipple. In the fœtal state, between the seventh and the ninth month, this glandular substance is found, but of smaller size. At the end of the first year, it is still large and continues so during the second and the third year; and thenceforward it seems to lessen in both male and female until the seventh and eighth year. It is most conspicuous in fat subjects, as it is kept extended from the nipple by the adipose substance.

Evolution of the nipple. — About the eighth year it begins to increase, but it varies as to time in different persons; and as it grows towards the age of puberty the nipple becomes evolved from it. In the female, at the age of puberty two tumescences will appear; the one a small sphere directly surrounding the nipple; which then rather sinks into this little swelling; and the other a larger sphere which is composed of the mammary gland, or gland of the breast. Thus there is a mammillary and a mammary growth; a mammillary producing the nipple, which is gradually evolved as the breast increases; a mammary which is composed of the lacteal gland, the lactiferous tubes of which proceed through the mammillary process. In the male the mammillary gland forms the nipple; but instead of tubes proceeding through it, ligamentous cords are seen radiating from the point of the nipple through the mammillary substance. These ligamentous cords terminate in a compact cellular texture at the basis of the nipple; and the cells thus produced become loaded with adeps, so as to sustain and preserve the projection of the nipple.

If, then, a section be made of the nipple of the male in the adult subject through its centre, radiated ligamentous cords are found in its substance, and a strong net-work containing fat at its basis. In the plate this will be well seen in a section of the nipple of Coombs, lately executed for murder, whom I selected on account of his age, and because he was a healthy person. I made a section through the nipple, and then threw it into warm water to melt out the fat which it contained, and thus unloaded the strong net-work of cellular tissue at its basis.

The evolution of the nipple is as follows:

In both male and female infants a gland exists which is the nidus of the future nipple, over which the skin is puckered into a small projection. This glandular substance lies concealed under the skin until near the age of puberty, and then it gradually evolves, and becomes everted into the nipple of the adult. In the male, the tubes through which the milk of the infant passes become ligamentous cords in the nipple of the adult, and in the female the similar tubes become the lactiferous ducts of the nipple. Thus it is that the nidus of the adult nipple is protected until the age of puberty.

Disease seated in this structure. — It is this structure, then, of the male and female nipple, prior to the age of puberty, at the time when evolution of the nipple is commencing, — which produces the swelling to which young people are subject, from the age of eight years to the period of puberty; for, when the action is greater than the evolution requires, a hard inflammatory swelling is produced.

It is in this structure that in future years the malignant areola or mammillary tumour forms. Here the scirrhous tubercle commences, which destroys the nipple, and ultimately extinguishes the the life of the patient. It is in this structure that the fungous swelling which the plate exhibits is formed; and both of these are from the male. The female is less subject to the disease, because the mammillary substance is principally absorbed, and lactiferous tubes are formed in its stead.

EXPLANATION OF THE PLATES.

PLATE I.

Fig. 1. A view of the nipple as it appears in the male fœtus.
Fig. 2. A section of the mammillary gland in the male child at birth.
Fig. 3. A posterior view of the mammillary gland in the male child at birth.
Fig. 4. A section of the mammillary gland of a male two years of age.

PLATE II.

Fig. 5. Section of the mammillary gland of a female twelve years of age.
Fig. 6. Section of the mammillary gland of a female four years of age.
Fig. 7. Section of the mammillary gland of a female at birth, with the vessels which proceed from the axilla.
Fig. 8. Section of the mammillary gland of a male five years of age.
Fig. 9. Section of the mammillary structure of Coombs (lately executed at Maidstone.)
The ligamentous substance seen which remains after the cessation of the glandular structure. Clusters of cells in the cellular tissue, from which the fat has been separated by putting the section into warm water.

PLATE III.

Three different views of a mammillary tumour, taken from a person of the name of Left, aged 40 years, on May 29th, 1824.

It commenced sixteen years before this period from a slight blow, but did not become larger than a pea during eight years. Four months before its removal it became occasionally painful, and increased considerably.

It was seated in the right breast behind the nipple and areola.

From the kind of pain he described to exist in it, I advised its removal. Upon cutting into it after the operation, I found it to have more of the fungoid than the scirrhous character, and was glad that I had removed it, as it appeared to me to be of a malignant nature.

I did not see the patient afterwards.

Fig. 1. *a*, Integument. *b*, The nipple. *c*, The tumour.

Fig. 2. *a*, Integument. *b*, The tumour.

Fig. 3. *a*, The tumour cut open.

On the 17th of November, 1824, I removed a tumour from the same situation for a hairdresser in the city. Its size was rather less than the former.

PLATE IV.

The disease represented in this plate begins in persons advanced in years, by a swelling behind the areola or nipple, and the latter becomes enlarged or drawn in.

When it ulcerates, the sore has a cancerous aspect; but it is rather more disposed to slough than the cancer of the female. The edge of the ulcer is ragged, the surrounding parts are hard, and the pain is of the lancinating kind, as in true cancer. The best case in illustration is to be found in the Medical Journal, published by Mr Elliott, now a chemist in Fenchurch Street.

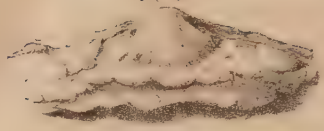
The disease extends to the absorbent glands in the axilla.

Fig. 4. An anterior view of the nipple of the male, in which the mammillary substance is affected with cancer; the nipple is enlarged, and the surrounding parts ulcerated. I removed it from a man between sixty and seventy years of age.

Fig. 5. An internal view of the same disease, a section having been made through it to show the scirrhous deposit. It has very much the character of cancer in the female breast. *a*, The surrounding adeps. *b*, The scirrhous deposit.

END OF VOL. II.

No. 5



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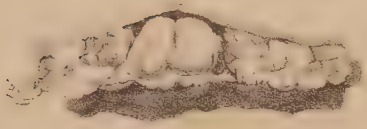

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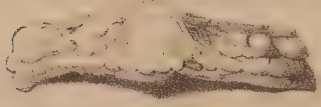

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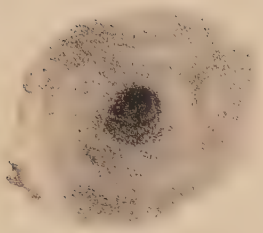

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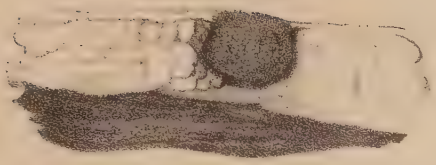

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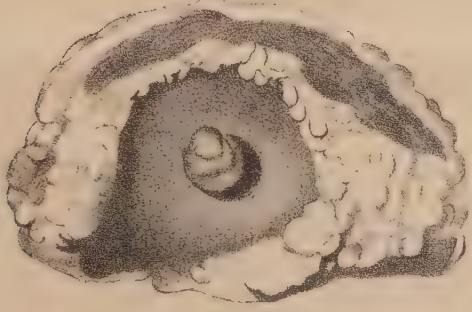

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Pendleton's Lithog.ʸ Boston.

Fig. 1

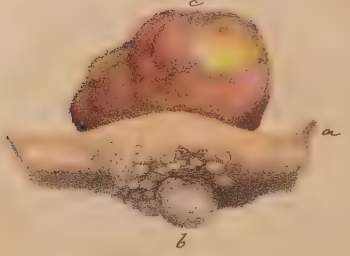


Fig. 2

Fig 3

Pendleton's Lithog.ʸ Boston.

Fig. 4

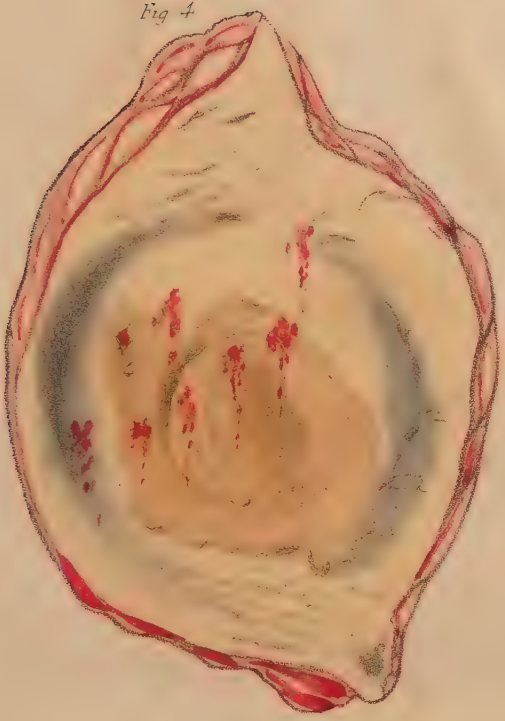
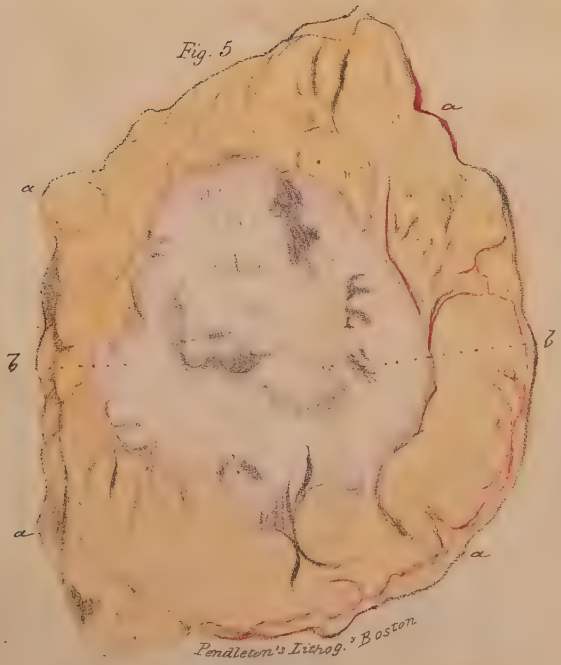


Fig. 5



Pendleton's Lithog. Boston